



NORTEL GLOBAL
PRODUCT AND SOLUTION
REFERENCE GUIDE
VERSION 6

NORTEL

NORTEL

NORTEL GLOBAL PRODUCT AND SOLUTION

REFERENCE GUIDE

VERSION 6

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NORTEL



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Issue: Version 6

TABLE OF CONTENTS

Introduction

Introduction	VII
--------------------	-----

Nortel Solutions

Security Solutions	1
Secure Multimedia Solution	4
Secure Network Access Solution	6
Secure Wireless Access Solution	9
Secure Information Access Solution	11

Mobility Solutions	14
Teleworker and Road Warrior Solution	18
Campus Mobile Worker Solution	20
Expert Anywhere Solution	23

Multimedia Communications Solutions	26
Multimedia Applications Solutions	29
Nortel Applications Center Solution	30
Nortel Contact Center 6.0 Solution	30
Converged Office Solution	30
Multimedia Infrastructure Solutions	31
Converged Branch Office Solution	31
Nortel Adaptive Clients Solution	32

Small- to Medium-Sized Business Solutions	34
SMB Solutions	36
Converged Voice And Data Solution	37
Telephony Solution	38
Mobility Solution	39
Data Networking Solution	40
Security Solution	41
Support Services Solution	42

Nortel Global Services

Nortel Maintenance Services	48
Technical Support Services	48
Repair Services	48
Managed Spares Services	48
Managed Onsite With Spares Services	48
Software Services	48
Nortel Managed Services	50
Managed Network Services	50

Managed Maintenance Services 50

Managed VPN Services..... 50

Managed Security Services 50

Nortel Optimization Services 52

Traffic Study And Optimization Services..... 52

Network Assessment And Audit Services..... 52

Nortel Security Services 54

Security Compliance Services..... 54

Security Consulting Services..... 55

Managed Security Services 55

Custom-built Security Operations Centers 55

Nortel Products

Nortel SMB Portfolio

Nortel SMB IP Telephony Platforms..... 59

Nortel Business Communications Manager 50..... 59

Nortel Business Communications Manager 200/400 66

Nortel Small and Medium Business (SMB) Data Portfolio.....75

Nortel Business Element Manager76

Nortel Business Ethernet Switch 100 Series.....77

Nortel Business Access Point 12081

Nortel Business Secure Router 200 Series 84

Nortel Enterprise IP Telephony Portfolio

Nortel Communication Server 1000 Portfolio 90

Nortel Media Gateway 1000 Portfolio 94

Nortel Media Gateway Portfolio100

Nortel Survivable Remote Gateway Portfolio.....103

Remote Gateway 9100 Series108

Remote Gateway 9115.....109

Remote Gateway 9150 111

Nortel Application Gateway 1000..... 115

Nortel Communication Server 1000 Telephony Manager 3.0..... 117

Nortel Large IP Telephony Platform

Nortel Communication Server 2100.....120

Nortel Communication Server 2100 Processors124

Nortel IP Clients

Nortel IP Desksets.....130

Nortel IP Phone 2000 Series130

Nortel IP Phone 1100 Series139

Nortel SoftClients144

Nortel Dual Mode Mobile Client 3100 (DMM 3100)
and the Nortel Dual Mode Client 3100 With VPN Software146

Nortel IP Softphone 2050148

Nortel Mobile Voice Client 2050 (MVC 2050)149

Nortel Multimedia Clients	151
Nortel Voice over Wireless LAN Handsets	152
Nortel WLAN Handset 2210	152
Nortel WLAN Handset 2211	153
Nortel WLAN Handset 2212	153
IP Client Accessories	155

Nortel Unified Communications Platforms

Nortel Multimedia Communication Server 5100	159
Nortel Multimedia Security Portfolio	164
Nortel Multimedia Clients	167
Nortel Converged Office	171
Nortel Unified Messaging Portfolio	174
Nortel CallPilot	174
Nortel Hospitality Messaging Server 400	180

Nortel Contact Center Portfolio

Nortel Contact Center 6.0 Suite	183
Nortel Remote Agent Observe	187
Nortel Agent Greeting	189
Nortel Contact Recording and Nortel Quality Monitoring	192
Nortel Symposium Express Call Center	194

Nortel Self-service Portfolio

Nortel Media Processing Server 500	199
Nortel Media Processing Server 1000	204
Nortel Speech Server	210
Nortel Web-Centric Self-Service	212
Nortel Corporate Directory Dialer	215
Nortel Communications Control Toolkit	219

Nortel Computer Telephony Integration Portfolio

Nortel Communications Control Toolkit	219
---	-----

Nortel Norstar Portfolio

Nortel Norstar Integrated Communication System	222
--	-----

Nortel Meridian 1 PBX Portfolio

Nortel Meridian 1 PBX Portfolio	228
IP Line Card	235
IP Trunk Card	237

Nortel Large Meridian Platform

Nortel Meridian SL-100	241
------------------------------	-----

Nortel Digital Desktop Portfolio

Nortel M3900 Digital Telephone Series	246
Meridian M2250 Digital Attendant Console and PC Console Interface Unit	251

Nortel Integrated Applications Portfolio

Nortel Integrated Conference Bridge	254
Nortel Integrated Call Director	258
Nortel Integrated Recorded Announcer	261
Nortel Integrated Call Assistant	264
Nortel Integrated Voice Services	266
Nortel Meridian 1/Nortel Communication Server 1000 Integrated DECT	267

Nortel Wireless LANs

Nortel Wireless Local Area Network 2300 series	273
Nortel Wireless Local Area Network Mobile Adapter 2202	281
Nortel Voice over Wireless Local Area Network Telephony Manager	284
Nortel WLAN Application Gateway 2246	287
Nortel Wireless Mesh Networks	289

Nortel Security Portfolio

Nortel Security Portfolio	294
Nortel Application and Web Switching	296
Nortel Secure Network Access Portfolio	304
Nortel VPN Portfolio	308
Nortel Secure Router Portfolio	324
Nortel Switched Firewall Portfolio	329
Nortel Threat Protection System Portfolio	340
Nortel Multimedia Security Portfolio	164

Nortel Application and Web Switching

Nortel Ethernet Routing Switch Web Switching Module	297
Nortel Application Switch Portfolio	300

Nortel Secure Network Access Portfolio

Nortel Secure Network Access Switch 4050	305
--	-----

Nortel VPN Portfolio

Nortel VPN Gateway 3050/3070	309
Nortel VPN Router Portfolio	316

Nortel Secure Router Portfolio

Nortel Secure Router Platforms	325
Nortel Secure Router 1000 series	326
Nortel Secure Router 3120	326

Nortel Switched Firewall Portfolio

Nortel Switched Firewalls	330
Nortel Switched Firewall 5100 series	333
Nortel Switched Firewall 6000 Series	336

Nortel Threat Protection System Portfolio

Nortel Intrusion Sensors and Threat Intelligence	341
--	-----

Nortel Ethernet Routing Switch Portfolio

Nortel Ethernet Routing Switch 8600 Series.....	347
Nortel Ethernet Routing Switch 8660 Service Delivery Module.....	353
Nortel Ethernet Routing Switch 8600 Web Switching Module	356
Nortel Ethernet Routing Switch 8661	359
Nortel Ethernet Routing Switch 8300 Series.....	362
Nortel Ethernet Routing Switch 1600 Series (1648T/1624G/1612G).....	369
Nortel Ethernet Routing Switch 1424T	373
Nortel Ethernet Routing Switch Redundant Power Supply 15	376
Nortel Ethernet Routing Switch 3510-24T	379
Nortel Ethernet Routing Switch 5510 Series	383
Nortel Ethernet Routing Switch 5520 Series.....	388
Nortel Ethernet Routing Switch 5530-24TFD	393

Nortel Ethernet Switch Portfolio

Nortel Ethernet Switch 325.....	398
Nortel Ethernet Switch 425.....	401
Nortel Ethernet Switch 460-24T-PWR.....	405
Nortel Ethernet Switch 470.....	410
Nortel Ethernet Switch 470-PWR.....	414
Nortel Ethernet Switch Power Supply Unit 10	419

Nortel Network Management

Nortel Enterprise Network Management System (ENMS)	423
Nortel Enterprise Policy Manager (EPM).....	427
Proactive Voice Quality Management (PVQM)	430
Enterprise Subscriber Manager.....	433
Nortel IP Address Domain Manager.....	436

Nortel Multiservice Switches Portfolio

Nortel Multiservice Switches.....	441
Nortel Multiservice Switch 7400 Series	443
Nortel Multiservice Switch 15000.....	447

Nortel Multiprotocol Router Portfolio

Nortel Multiprotocol Router 2430	451
Nortel Advanced Remote Node Router	454
Nortel Multiservice Access Switch 4400 Series	457
Nortel Multiprotocol Router 5430	460
Nortel Access Stack Node Router	463
Nortel Backbone Node Router.....	466

Nortel IP Services Routing Portfolio

Nortel Services Edge Router 5500	472
--	-----

Nortel Optical Metro Platforms

Nortel Optical Metro 3000 Series	481
--	-----

Nortel Optical Metro 5000 Series 485

Nortel Common Photonic Layer 490

Nortel Optical Multiservice Edge Platforms

Nortel Optical Multiservice Edge 1000 Series 494

Nortel Optical Multiservice Edge 6110 499

Nortel Optical Multiservice Edge 6500 503

Nortel Carrier Ethernet

Nortel Metro Ethernet Routing Switch 8600 508

Nortel Optical Metro 1000 Series 511

Nortel Metro Ethernet Services Unit 1800/1850 516

Nortel Business Continuity System 3000 Portfolio

Nortel Business Continuity System 3000 Data Center 521

Nortel Business Continuity System 3000 Branch Office 525

Nortel Select Products

AMC Multichannel Integration Suite 529

Concord Communications eHealth Suite 531

ConverTec Console.NET 533

Datapulse IP Operator Gateway 536

ipDialog SipTone III SIP Phone 538

Mediatrix 541

Mertek JCS Cable Assembly 544

Qovia E911 Location Gateway Server 545

Quintum Tenor Multipath VoIP Gateway 547

Real Time Monitors Reporting 550

Soft-ex Call Management Solutions 553

Symon Enterprise Server 557

Teleopti Contact Centre Solutions 560

Unique Communications CAIRS OSS 564

Introduction

Welcome to the Nortel Global Product and Solution Reference Guide. This publication specifically provides brief solution, services and product overviews including pertinent technical specifications and examples of how businesses can apply Nortel solutions in the marketplace. The guide is published for end-user customers, analysts, consultants, Nortel partners, resellers, and sales account teams who need a broad, high-level overview of Nortel Enterprise products.

Because this guide is updated periodically, new products and solutions might not be included in this edition. Be aware that not all products and solutions described in this publication are available or applicable to all global regions. For additional information and assistance, contact your local Nortel representative or visit www.nortel.com.

We hope you find this publication helpful and easy to use.

We want to hear from you!

Nortel is always eager to improve upon what it does; therefore, Nortel invites you to participate in its reader survey. In updating subsequent versions of the Reference Guide, your feedback helps Nortel to understand and meet your information needs, and helps improve the publication to become an effective tool for you.

To express your opinions and comments on this edition of the Nortel Global Product and Solution Reference Guide, go to www.nortel.com/refguidesurvey.

Business Made Simple

Nortel is a recognized leader in delivering communications capabilities that enhance the human experience, ignite and power global commerce, and secure and protect the world's critical information.

- You will find Nortel wherever secure, reliable, data, and voice communications are crucial. Each day, hundreds of millions of people around the world rely on Nortel for wireless communications.
- From WLAN to WiMax to third generation, Nortel was the industry's first end-to-end provider of all next generation wireless solutions.
- Across a dozen sites at the 2006 Winter Olympic Games in Italy more than 2500 athletes from 80 countries plus thousands of journalists and event staff members relied on Nortel to keep them connected.
- Every single one of the top 10 universities in North America relies on Nortel, serving more than 500 000 students.
- Nine out of 10 of the largest U.S. public school districts run on Nortel serving more than 3.5 million students.
- More than 10 000 education customers worldwide have installed communications solutions from Nortel, including the University of Connecticut, the University of Texas at Austin, Massachusetts Institute of Technology, Seoul (Korea) National University, Northwestern University, Ohio State University, the University of Ulster (Ireland), Saga University, George Mason University, the University of Granada (Spain), The Open University of Israel, Israel's Center for Educational Technology, Bosphorus University (Turkey), Worcester Polytechnic Institute, and the Philadelphia Unified School System.
- Nortel has made secure connectivity available to over 100 million users worldwide to help enable the benefits of telecommuting across companies worldwide. In fact, by 2020 the world's oil reserves are expected to be reduced by 50 percent. If 175 cars are taken off the road each day because those employees are telecommuting, a company with 1000 employees can save 44 000 gallons of gasoline annually and reduce greenhouse gas emissions by 420 metric tons per year.

- Nortel has been central in enabling the growth and development of China for more than 30 years and deployed China Telecom's 15 000 km national optical network—one of the world's longest optical networks – and we continue to work with them on the deployment and expansion of a number of their regional and provincial wireless and wireline networks.
- Nortel is a key driver in the growth of India, serving as a key supplier for Reliance Infocomm's nationwide, optical network- the largest of its kind ever built in Asia at the time—60 000 km of fiber connecting 2700 cities, towns, and villages.
- Nortel has built the world's largest wireless mesh network in Taipei, Taiwan – so now the 2.88 million residents have mobile, high-speed access anywhere in the city.
- You will find Nortel behind the world's largest and most important stock exchanges, supporting billions of transactions in New York, Shanghai, Australia, Mumbai, Seoul, Buenos Aires, and Sao Paulo.
- Nine of 10 Fortune 500 companies rely on Nortel each day.
- You will find Nortel in every single one of the world's top 20 airlines, helping more than 600 million people move around the planet each year.
- Nortel is the only networking vendor to have deployed 50 million telephony lines and 50 million Ethernet ports.
- Across the globe, Nortel has designed and deployed over 200 speech applications for automating and improving routine business functions in more than 15 languages.

Global Industry Recognition

2006 Highlights

Nortel Receives National Environmental Award

Smog Summit, June 07, 2006

TORONTO - The Nortel [NYSE/TSX: NT] GreenCommute program in Ottawa received a Clean Air Day Award for "Outstanding Contribution to Clean Air" at the 2006 Smog Summit held in Toronto. The two-day Summit brings together federal, provincial, and municipal government leaders to discuss new initiatives focused on improving air quality.

Visit: <http://www.cleanairpartnership.org/smogsummit/index.php>"Smog Summit 2006" <http://www.nortel.com/corporate/nltrs/nnupd/index.html>"GET UPDATES"

Nortel Business Communication Manager 50 (BCM50) wins Networking Computing's 2006 Well-Connected Award

Network Computing, April 26, 2006

Nortel Business Communication Manager 50 (BCM50) has been awarded Networking Computing magazine's 2006 Well-Connected Award in the Network Infrastructure, Small Business Telephony Solution category. The Well-Connected Awards honor outstanding technology products and services representing the very best the technology industry has to offer. The winners are chosen by Network Computing's technology editors from products that have been tested and evaluated in the Network Computing labs.

Nortel Government Solutions, ITG Receive Department of Homeland Security Award

U.S. Department of Homeland Security, April 24, 2006

The U.S. Department of Homeland Security (DHS) honored Nortel Government Solutions and Interactive Technologies Group (ITG) with a Mentor-Protégé Team Award. DHS created the Mentor-Protégé Program to cultivate longstanding, beneficial business relationships between large prime contractors and small businesses. This award recognizes achievements under the DHS Mentor-Protégé Program. Nortel Government Solutions and ITG were recognized for their joint efforts in providing a range of cultings and IT services to such DHS agencies as the U.S. Coast Guard, U.S. Imigration and Customs Enforcement, and U.S. Citizenship and Immigration Services since entering into a Mentor-Protégé agreement in February 2004.

Nortel Business Communication Manager 50 (BCM50) named Product of the Year at the OCRI Awards Ceremony

Network Computing, April 26, 2006

Nortel Business Communication Manager 50 (BCM50) won the "Product of the Year" award at Ottawa Centre for Research and Innovation (OCRI) Awards Ceremony, a gala evening that is essentially the Academy Awards for the high-tech industry in Ottawa. Ottawa Centre for Research and Innovation (OCRI) is the leading development corporation in Ottawa, bringing business, education, and research together to help local technology companies thrive and compete globally.

Nortel Business Communication Manager 50 (BCM50) awarded 2005 Product of the Year by Internet Telephony Magazine

Internet Telephony, February 1, 2006

Nortel Business Communication Manager 50 (BCM50), the market-leading, all-in-one, affordable converged voice and data communications solution for small to medium business and branch offices, was named 2005 Product of the Year by Internet Telephony magazine.

Nortel wins 4 ContactCenterWorld.com Members' Choice Awards*

ContactCenterWorld.com, March 30, 2006

Nortel won four 2006 ContactCenterWorld.com Members' Choice Awards - ACD for the Americas, Best ACD for EMEA, Best ACD for the World, and Best Self-Service Solution for EMEA. Unlike most other industry awards, the Members' Choice Awards are based purely on the quality of feedback from ContactCenterWorld.com members and end users of the solutions. This means that the awards are an indication of how the winners and their solutions perform.

Nortel Awarded 5 Star Rating for its Partner Programs by VARBusiness Magazine

VARBusiness, March 2006

For the third year in a row, VARBusiness Magazine recognized Nortel as one of North America's top vendors based on the support Nortel provides to its value-added resellers (VARs). Nortel received a Five-Star Rating, reflecting the excellence of its channel partnering programs.

Timothy Williams awarded the 2006 Compass Award®

CSO, March 2006

Nortel Chief Security Officer, Timothy Williams, won the 2006 Compass Award. Williams is recognized for his leadership within a converged security department as well as his management skills in risk assessment, crisis management, employee protection, and security-related investigations.

Nortel wins best of show at Internet Telephony Conference and EXPO

Technology Marketing Corporation (TMC), February 13, 2006.

Technology Marketing Corporation (TMC) awarded Nortel its prestigious best of show "Overall Best" category for breadth of portfolio for products such as the award-winning Nortel Multimedia Communication Server (MCS) 5100 and the Nortel Business Communications Manager 50 (BCM50), which were on display on the exhibit hall floor. The award recognized the Nortel commitment to being a driving force in the VoIP industry and how it continues to be at the forefront of the telecommunications industry in leading the transition to VoIP.

Nortel awarded CallPilot 4.0 awarded Product of the Year by Customer Inter@ction Solutions magazine

Customer Inter@ction Solutions® magazine, 2006.

Each year, Customer Inter@ction Solutions magazine bestows its Product of the Year awards on companies that have demonstrated excellence in technological advancement and application refinements. Nortel's CallPilot 4.0 was awarded the 2005 Product of the Year Award in the Contact Center Suites category for having gone the extra mile to help improve both the customer experience and the ROI.

Nortel's VPN Gateway wins two 2006 SC Awards

SC Magazine, January 2006

SC magazine announced its 2006 SC Awards at a gala at the Fairmont Hotel in San Jose, California. Nortel's VPN Gateway won two awards in the categories of Best SSL VPN and Best Remote Access.

Nortel's VPN Gateway wins 2006 Bronze Award

Information Security & SearchSecurity.com, January 18, 2006

Information Security and SearchSecurity.com have awarded Nortel's VPN Gateway the 2006 Bronze Award in the Remote Access category.

Nortel Home Page

Nortel home page is www.nortel.com. The Nortel home page provides customers, investors, and the general public with the latest information on solutions, services, and products; how to order tools; how to buy; support; training and certification; channel partners; communities; news and events; careers; corporate information; media center; investor relations; and country and region information.

Nortel Enterprise and End-user Communities

Nortel offers and supports several user groups for its enterprise and end-user customers. Some of these groups include:

- Centrex Users Group
- Contivity IP Services Users Group (CIPSUG)
- Inform Community
- INSIGHT 100
- International Nortel Users Association (INNUA) and Global Connect
- Nortel Anwendervereinigung (NNAV)
- Packet Voice and Multimedia Users Group
- Passport Multiservice WAN Users Group

A number of communities are available for customers with special interests. Nortel develops special interest communities on an ongoing basis. If you are interested in joining a community, contact your Nortel Account Manager for more information.

Nortel Technical Support Portal

With the Nortel 24-hour-a-day, 7-day-a-week e-service capability, our customers can access key Nortel technical documentation through an easy-to-use Web portal. The Technical Support Portal (www.nortel.com/support) is a personalized Web environment that dynamically delivers technical product content including product documentation, software, technical solutions, bulletins, and online tools such as the Knowledge Base and the Service Request Tool.

Partner Information Center

The Partner Information Center (PIC) is a password-protected Web portal available only to Nortel Enterprise channel partners who sell and support Nortel Enterprise solutions, services, and products. The site provides exclusive content and tools to enable partners to perform all functions of the sales cycle. Access to regionally specific information within the main Partner Information Center site exists to meet the differing geographic needs of Nortel business partners. The following parties can access the Partner Information Center:

- Enterprise channel partners who participate in regional Nortel partner programs
- Nortel Global Solutions Partners (GSPs)
- consultants who participate in the Nortel Consultant Liaison Program
- Nortel stocking distributors

All requests for access to the Partner Information Center are verified for eligibility prior to access being granted. Registered users of the Partner Information Center can access different types of restricted content depending on their entitlement levels. After users register, Nortel assigns levels according to the relationship with Nortel.

New users can go directly to www.nortel.com/register to register their information.

Nortel Training and Certification

Nortel Training and Certification Program information is available at www.nortel.com/tc. You can view complete course descriptions, detailed certification descriptions, online registration and scheduling either globally or by region.

Find a Reseller or Channel Partner

Finding the right Nortel partner requires just a few clicks. Whether yours is a small to medium business or a global enterprise, a Nortel channel partner exists that is ideally suited to meet your requirements. Using the Nortel Partner Locator tool, you can find a Nortel channel partner almost anywhere in the world who can deliver voice, telephony, data networking products, or integrated solutions.

From www.nortel.com, under Products and Services, select How to Buy, Find a Channel Partner, and then follow the prompts.

NORTEL
SOLUTION GUIDE

Security Solutions

Overview

Nortel's approach to network security, called the Layered Defense

The Nortel approach to security, called the Layered Defense, helps ensure that no single points of security failure exist in a network. Using this approach, the network can adapt to new and changing threats.

The Nortel Layered Defense approach encompasses:

- communication security (VPN)
- perimeter security (firewall)
- security management
- platform security
- core network security (Intrusion Detection, Prevention, and Threat Mitigation)
- Endpoint security (Identity Management and Endpoint Policy Compliance)

The solutions that build on this Layered Defense approach are:

- Secure Multimedia
- Secure Network Access
- Secure Wireless Access
- Secure Information Access

Security Solutions

Nortel security solutions offer:

- lower cost of ownership
- open, standards-based architecture for ease of integration
- superior overall quality of experience for end users

Secure Multimedia	Secure Network Access	Secure Wireless Access	Secure Information Access
Based on: • VPN Router • VPN Gateway • Secure Multimedia Controller 2450 • Switched Firewalls • Application Switches • IP Phones 200x and, 11xx • Mobile Voice Client 2050 and Software Phone 2050 • WLAN Handsets 2210, 2211, and 2212 • Threat Protection System • Enterprise Policy Manager	Based on: • VPN Router • VPN Gateway • Nortel Secure Network Access Switch • Ethernet Routing Switch 8300 series • Ethernet Routing Switch 5500 series • IP Phones 200x, 11xx, and Softphone 2050 • Enterprise Policy Manager • Fixed price implementation • Security Policy Engineering	Based on: • VPN Router • VPN Gateway • Nortel WLAN 2300 series • WLAN Handsets 2210, 2211 and 2212 • Nortel Wireless Mesh 7200 series • Nortel ERS 5520 (provides Power over Ethernet [PoE])	Based on: • VPN Router • VPN Gateway • Switched Firewalls • Threat Protection System

Why Nortel?

- Nortel was awarded the SC Magazine (formerly Secure Computing) 2006 award for Best Remote Access (Nortel VPN Gateway) and Best SSL-VPN (Nortel VPN Gateway).
- Nortel was awarded the 2005 Frost & Sullivan Product Line Strategy Award for the VoIP Security Solutions Strategy.
- Nortel occupies the Gartner Group "Leader Quadrant" in its IPsec, SSL VPNs, and Corporate Telephony categories.
- Nortel secures hundreds of millions of wireless calls every day.
- Nortel is the first end-to-end provider of Joint Interoperability Test Command (JITC)-certified convergence solutions—our solutions are embedded in the networks of the U.S. Department of Defense.
- Nortel makes secure connectivity available to more than 100 million users worldwide.
- Nortel built highly resilient, mission-critical communications systems for over 100 years.
- Nortel was one of the first companies to build 802.1x authentication into Ethernet switches.
- Nortel was the first company in the world to accelerate firewalls.
- Nortel was the first company to deliver VPN remote access security policy enforcement.
- Nortel is used in the world's largest and most important stock exchanges to support billions of transactions.
- More than 80 percent of the top 100 banks in the United States rely on Nortel for security solutions.

Industry Needs

Health care

- Legislated requirements for retention and protection of patient records.
- Health care solutions must allow patient data and clinical information to be both secure and immediately available at the point of diagnosis and at the point of care.

Government

- Major initiatives across federal, state, and local government agencies are underway to improve law enforcement and counterterrorism efforts by sharing intelligence from a central depository.
- The Federal Bureau of Investigation (FBI) and the National Crime Information Center (NCIC) mandate minimal encryption standards at 3-DES or better for all state criminal justice information networks; replacing legacy routers to support encryption is neither technically feasible nor economically practical in many cases.
- With the addition of new applications and new partner agencies, traditional, dedicated data connections between government jurisdictions and agencies place an unsustainable cost burden on stakeholders.
- Traditional, dedicated network connections lack bandwidth performance to handle the growing need to implement new biometric application files, which consist of textual, photographic, fingerprint, graphic, and page image data.
- Information networks must demonstrate and deliver high availability and disaster recovery to support government continuity plans for service delivery during and after an emergency.
- The negative press and public reaction to a loss of life or property that occurs as the result of substandard government networks can be politically damaging to a government administration.

Higher Education

- Creating a safe campus environment.
- Helping to ensure privacy by shielding school and student information from unauthorized access using appropriate authentication and encryption technologies.
- Protecting the campus network from theft, specifically, loss of intellectual property from eavesdropping, and toll fraud.
- Verifying network reliability by protecting the campus network infrastructure from service disruption caused by viruses and various network attacks.
- Growing use of wireless LAN technologies on higher education campuses creates a strong need for wireless security solutions.
- Increasing use of e-learning solutions creates a strong demand for VPN access.
- Securing endpoint devices on the network includes remote endpoints (for students, teachers, and staff accessing the network remotely) and internal endpoints (users connected directly to the campus network).

K-12 Education

- Helping to ensure a safe school environment is a priority.
- K-12 institutions focus on helping to ensure privacy by shielding school and student information from unauthorized access by using appropriate authentication and encryption technologies.
- Helping to ensure network reliability by protecting the school network from service disruption caused by viruses and various network attacks.
- Protecting the school network from theft, the loss of intellectual property from eavesdropping and toll fraud.
- A strong need for wireless security solutions due to the growing use of wireless LAN technologies in schools.
- Requirements for physical security include video surveillance solutions, wireless telephony for rapid response, and radio frequency identification (RFID) tagging to monitor students and school assets.

Finance

- Helping to ensure security and confidentiality of a customer's personal information.
- Protecting against ever-increasing internal and external security risks (such as DDOS, worms, and viruses) that impact business continuity and increase operational risk.
- Maintaining customer trust and confidence by avoiding direct loss and damage to reputation from bad publicity.
- Compliance with increasing regulations and mandates, including Gramm Leach Bliley (GLBA), Basel II, Sarbanes-Oxley (SOX), U.S. Patriot Act, and 3-DES industry mandates for ATMs.
- Enhanced authentication for online channels to deal with the increasing threat of fraud through "phishing" and "pharming" scams.
- Providing secure access to deploy sales tools for mobile sales representatives serving high-value clients without compromising security.
- Achieving high visibility of key risk indicators (KRI).
- Verifying that new applications such as wireless, VoIP, and multimedia applications are secure and meet regulatory compliance as the organization implements new applications.

Secure Multimedia Solution

Overview

Nortel Secure Multimedia Solution securely deploys multimedia technologies and services such as VoIP and SIP by incorporating firewalls, encryption, authentication, and toll-fraud prevention.

All the benefits associated with multimedia applications and IP telephony, lower operations costs and increased productivity, can be lost by risks such as viruses, worms, identity theft, information theft, service theft, and software vulnerabilities. By using Secure Multimedia Solution with IP telephony, organizations can achieve communications privacy and reliability while minimizing both service and identity theft.

Nortel Secure Multimedia Solution delivers:

- high-grade encryption technologies that help to ensure privacy, regulatory compliance, and intellectual property protection and eliminate the threat of eavesdropping and tampering
- redundant, survivable components and networks that help ensure reliability and business continuity
- strong authentication on every transaction minimizes service theft, toll fraud, and identity theft

Ideal For

Converged networks are prone to security issues because they share the security vulnerabilities of traditional telephony and IP networking. In fact, attacks on IP networks are becoming more prevalent every year.

While many businesses move to multimedia communications over converged networks, security is the single largest concern of the organizations not yet using multimedia and IP telephony.

Businesses that suffer IP network outages or security breaches can face potential losses in many areas such as:

- Productivity: workers cannot communicate or get work done.
- Revenue: lost orders and customers, toll fraud, and theft of service.
- Risk mitigation: theft of intellectual property.
- Customer confidence and loyalty: if private customer information is stolen.
- Brand image: damage to reputation from negative public relations.
- Regulatory: noncompliance consequences with the Sarbanes-Oxley (SOX) Act, the Gramm Leach Bliley Act (GLBA), the Health Insurance Portability and Accountability Act (HIPAA), and other mandated regulations.

Business Challenges

- Do you consider multimedia and IP telephony in your security plan?
- Does your IP telephony plan take into account security to help ensure reliability, privacy, and integrity of communications?
- How do you help to ensure that your production-level rollout of multimedia communications, converged applications, and IP telephony is never compromised by denial of service attacks, viruses, worms, hackers, and other security risks?

Nortel Solution

Modern, comprehensive security plans that are now required by federal government regulations, such as the SOX Act, the GLBA, and the HIPAA, need to take into account all the ways organizations communicate, including multimedia and wireless. The Secure Multimedia Solution builds on the key strengths of Nortel in multimedia communications, and security to deliver a solution that helps organizations maintain the reliability, privacy, and integrity of their communications.

Nortel Secure Multimedia Solution uses industry-leading Nortel multimedia solutions, including MCS5100, Communication Server 1000 or Communication Server 2100, BCM200/400, and Nortel Unified Messaging.

Secure Multimedia Solution also takes advantage of network-level security, including:

- Nortel Secure Multimedia Controller
- Switched Firewalls
- Application Switches
- Threat Protection System (TPS)
- Intrusion Detection
- Policy Based Management
- VPN Routers
- VPN Gateways
- Nortel Secure Network Access (NSNA)
- 802.1x Extensible Authentication Protocol

Features and Benefits

Feature	Benefit
Nortel Secure Multimedia Controller	• Creates a near-instant Secure Multimedia Zone to protect Nortel communication servers and multimedia applications from denial of service and other attacks. • Protects servers and services, and maintains high performance while lowering cost of operation and administrator resources. • Provides authentication and signaling encryption between a user's IP Phone and the Secure Multimedia Zone to help to prevent impostor phones or impostor servers launching man-in-the-middle attacks and remote takeovers of IP Phones • Next phase of Secure Multimedia Controller will enable standards-based voice encryption (SRTP) with planned support on Phase II 200x phones and 1120E/1140E phones
Nortel Threat Protection System	• Polices the user network to provide zero-day protection and stop attacks at the source, before malware or other attack software affects voice and multimedia performance.
Nortel Secure Network Access, Tunnel Guard Extensible Authentication Protocol	• Authenticates and validates endpoints (including , 802.1x, IP Phones) on the network, ensuring that only authorized endpoints can join. • Keeps end-users from adding unauthorized devices to the corporate network. • Maintains and enforces corporate policy compliance as endpoints are checked for compliance before accessing the corporate network.
Nortel VPN Gateway, Nortel VPN Router, Wireless Security Switch	• Maintains privacy of communications for branch offices, teleworkers, and wireless users by encrypting both data and voice traffic over untrusted networks using SSL or IPSec technologies.
WLAN Handsets 22xx	• Provides standard security through wireless encryption protocol (WEP) and WPA2 portion of 802.11i. • Provides enhanced security with IPSec VPN encryption for voice, signaling, and data applications on WLAN Handset 2212 and Mobile Voice Client 2050. • Supports Virtual Office Login for user password authentication.
Nortel Switched Firewall	• Provides high-performance data protection at the border between organizations or suborganizations where networks or subnets have different trust levels. • Minimizes performance impacts, such as loss, latency, jitter, that drastically affect voice and multimedia quality.

Secure Network Access Solution

Overview

The Secure Network Access Solution is the Nortel solution for endpoint security protection and policy compliance across the enterprise LAN, WLAN, WAN, and VPN. Endpoint security protection and policy compliance are significant because remote endpoints typically do not operate with policy enforcement beyond antivirus and personal firewall software. Remote endpoints reconnect to the enterprise network inside areas of traditional perimeter protection against external attacks. Consequently, viruses and worms can easily bypass firewalls and other security systems. The risk increases exponentially for unmanaged endpoints, such as a WLAN deployed by an employee at home or a wireless Personal Digital Device (PDA) not approved by company IT administrators and not covered by the enterprise security policy requirements.

Secure Network Access helps organizations take a proactive stance in deciding if a device can be connected to their networks.

Ideal For

As organizations outsource some responsibilities, enable guest access on premises, invite more partner participation, and support mobility among their own workforces, they leave their networks more exposed to potential attacks. Networks today contain more rogue endpoints and, therefore, invite greater risks. As they continue to deploy end-user devices they correspondingly increase network vulnerabilities.

Business Challenges

- Are all your patches and virus definitions up to date?
- Are your business processes and networks resilient enough to continue working if they experience a security attack?
- Do your security teams analyze systems in real time to check for security policy compliance?
- Does your network respond automatically to an attack by removing the offending traffic or device from the network without administrator intervention?

Nortel Solution

The Nortel Secure Network Access Solution is an open, clientless solution that allows the enterprise customer to configure and enforce compliance for a single, consistent security policy across LAN, WLAN, WAN, and VPN

services. Organizations can ensure that all user systems connected to the network have correct configuration and, therefore, are unlikely to introduce viruses, spyware, malicious code, or attack points into the corporate network. The Secure Network Access Solution is device independent so it can support several network access options. The solution uses a quarantine network that enables noncompliant devices to access repair and remediation software or configuration file updates to achieve compliance with the security policy before accessing the corporate network. In addition, the Secure Network Access Solution enables trusted, context-based access only, so users can access only network segments and applications approved for their profiles.

Secure Network Access Solution can ensure that all devices meet the corporate security policy before they gain network access and reduce the risk of virus or malware infections, inappropriate or undesirable configurations, or misconfigured systems connecting to the network. This controlled access model delivers an incrementally secured network environment in a landscape of heightened threats.

The critical component of the solution is the Nortel Secure Network Access Switch, which acts as an intelligent security gateway that

proactively works with Nortel industry-leading VPN routers, VPN gateways, and Ethernet routing switches to verify that any PC that attempts to access the network is fully compliant with all required antivirus, software patch, and firewall security policies. Further, the Nortel Secure Network Access Switch grants only trusted context-based access for users to approved network resources and applications.

The Secure Network Access Solution derives from the Trusted Computing Group's open architecture and software initiative. Collaboration is the key to creating a beneficial ecosystem on the network for partners to participate with their unique security technologies. The solution includes leading technologies from Nortel strategic partners to reduce the level of complexity required to find and implement a complete solution.

The solution complements Microsoft Network Access Protection (NAP), a leading architecture and interface for network access. Nortel works closely with Microsoft to deliver NAP support across the Nortel enterprise product line. Nortel plans to have switches, routers, and gateways include smart ports that can communicate with Microsoft RADIUS-based Network Policy Server and Network Access Protection clients to enforce common set of security policies across Nortel and Microsoft platforms in the network.

By implementing Secure Network Access Solution, organizations can:

- improve operational efficiency by eliminating viruses and malware before they spread into the network
- reduce the risk of information and other asset loss
- manage and maintain compliance to policy and legislation, such as the Sarbanes-Oxley Act, the Gramm Leach Bliley Act (GLBA), the Health Insurance Portability and Accountability Act (HIPAA), and other mandated regulations, thereby reducing the probability of noncompliance penalties

The Nortel Secure Network Access Solution Phase 1 uses Tunnel Guard technology to provide compliance for operating system update level and virus software verification for VPN services in the VPN Router and VPN Gateway; Phase 2 extends endpoint security to the LAN components, including IP Phones. The solution includes an array of professional services, including network design, installation and maintenance, and managed service offerings.

Secure Network Access solution comprises the following components:

- VPN Router
- VPN Gateway
- Nortel Secure Network Access Switch
- Ethernet Routing Switch 8300
- Ethernet Routing Switch 55xx series
- IP Phones i2002, i2004, i2007
- Fixed Price Implementation Service
- Security Policy Engineering
- Support/Maintenance

Features and Benefits

Feature	Benefit
Consistent, centralized security policy application	• Reduces management complexity with one security policy applied across all networks, enables granular auditing mechanisms.
Ongoing security checks	• Reduces the risk to the organization by checking a device against the policy when it connects to the network. Advise users if their configuration changes during the session and redirect them.
Out-of-path implementation	• Eliminates latency. • Does not affect network bandwidth or cause congestion.
Clientless	• Lowers deployment and operating costs.
Open Standards implementation	• Lowers integration costs and reduces potential interoperability problems.
Device agnostic	• Supports most endpoint devices, PDAs, PCs, Softphones.
Scalable, flexible architecture	• Lowers engineering costs and decreases the number of additional network elements.

Nortel Secure Wireless Access Solution

Overview

The Nortel Secure Wireless Access Solution is a complete, 802.11-based offering for organizations that want to deploy widespread wireless coverage for today's business, IP telephony, and converged multimedia applications. The solution combines the latest industry wireless standards with a central architecture and advanced features to create a secure, cost-effective, and highly scalable WLAN infrastructure.

The Secure Wireless Access Solution covers all aspects of wireless technology—in both campus and wide-open area implementations—for warehouses, rural communities, and airports. The solution includes an array of professional services, from network design, installation, and maintenance to managed service offerings.

Ideal For

The rate of wireless LAN deployments continues to increase with high levels of growth projected. Correspondingly, the risks of data and service theft continue to increase as more users and enterprises shift to a wireless operation. IT staffs continue to balance widening network access and ease of use against minimizing data theft by protecting the information as it moves across the wireless network.

Business Challenges

- Do you offer wireless LAN services to your employees or customers today?
- Can your existing wireless network locate and contain rogue access points to prevent unauthorized access to your network?
- Do you want to allow visitors to your office controlled wireless network access?
- Can your wireless network respond automatically to an attack by removing the offending traffic or device from the network without administrator intervention?

Nortel Solution

With the Nortel Secure Wireless Access Solution, enterprises can enhance employee productivity associated with mobility without the fear of information theft, low application reliability, loss of privacy, and complicated management. Secure Wireless Access Solution uses "thin" access points so that all wireless and security policies are managed on the switch. Automatically configured access points are run using Power over Ethernet (PoE). The wireless mesh access points do not need cabling for the network infrastructure.

The configuration and planning tool can identify potential coverage gaps by overlaying the access points onto a floor plan diagram. Conversely, the tool can identify areas where coverage exists but none is desired.

The access points can automatically adjust power levels based on local interference. Users can roam from one access point to another with no degradation in voice or data quality.

Secure Wireless Access Solution supports industry-standard data encryption methods to protect the data over the wireless interface. The data encryption methods can be used in either internal secure mode, relying on the wireless security switch to authenticate and encrypt the data, or in VPN pass-through mode in which the VPN appliance authenticates and encrypts data.

The solution includes leading technologies from Nortel strategic partners to reduce the level of complexity required to find and implement a complete solution.

The solution comprises the following components:

- VPN Router
- VPN Gateway
- Nortel WLAN 2300 series (WLAN Security Switch, WLAN Access Points)
- WLAN Handsets 2210, 2211, 2212 (Voice over WLAN with IPSec VPN Client)
- Nortel Wireless Mesh 7200 series
- Nortel ERS 5520 (provides PoE to the wireless access points)

- Secure Planning and Design services
- Installation and Integration services
- Maintenance, Management, and Security services
- Managed services

Features and Benefits

Feature	Benefit
Secure, scalable wireless networking	• Automatically configures the WLAN 2300 Access Point. Plug the Access Point into the network, apply the power, and the wireless security switch configures it.
User-selectable deployment	• Gives the choice to either enable the security features or use VPN pass-through mode at installation time.
Advanced access point and radio frequency (RF) planning	• Makes it easy to decide where to locate access points to provide the best possible coverage.
Wireless intrusion detection	• Detects attacks coming through the wireless network and performs the configured action to prevent attacks from entering the wired network.
Rogue access point detection and mitigation	• Detects access points that are not part of the network span of control and takes denial of service action.
Easy guest user access management	• Allows guests specific, controlled network access provisioned by the receptionist at the front desk.

Nortel Secure Information Access Solution

Overview

The Secure Information Access Solution enables secure access to an enterprise's corporate information regardless of the user's location—internal or external. Enterprises that provide remote access services, such as dial-up service to mobile or teleworkers, can benefit from this solution by lowering the costs of dial-up service and providing high-speed access to that information.

Scenarios in which this solution can be applied include:

- Sales force access: a sales representative can provide a customer a quote for specific products and services directly from the customer's office.
- Secure access on the road: mobile and teleworkers can access corporate resources from hotels and other potentially hostile networks.
- Maximum business partner connectivity: a business can lower the costs of bringing a business partner into the network or revoking the access later.
- Help to ensure privacy of data required by regulations: communications within the enterprise remain secure even as they cross the LAN.

Ideal For

Customers have virtual private network (VPN) technologies deployed, but can experience:

- problems with equipment capacity
- a desire to add new features and services
- old equipment that needs upgrading
- redundant, multivendor network gear to support new IPSec and SSL VPN services
- continuous concern about data privacy driven by the loss of sensitive corporate intellectual property, legislation, user awareness, and bad publicity based on data theft

Business Challenges

- Do you restrict access to some business applications?
- Do you restrict access to nonbusiness applications such as instant messaging and music downloads?
- Does your company have a mobile sales force and remote branch offices?
- What percentage of your employee base is mobile or in branch offices?
- Has your company embraced home-based employees and teleworking?
- How important is remote access to your employee productivity?
- Are your business processes and networks resilient enough to continue working if they experience a security attack?

- When rolling out a convergence solution, did you consider security as part of your Quality of Service strategy?
- Does your business network respond automatically to an attack by removing the offending traffic or device from the network without administrator intervention?

Nortel Solution

The Nortel Secure Access Security solution comprises the following components:

- VPN Router
- VPN Gateway
- Switched Firewall
- Threat Protection System

Nortel Secure Network Access Solution (which features 802.1x Extensible Authentication Protocol and Tunnel Guard technology) is positioned to provide complete endpoint security. The Nortel VPN router and VPN gateway platforms can provide both IPSec and SSL VPN services in a single platform to lower the customer's network complexity, and operating and management costs.

Early warning of attacks through data acquisition and analysis tools is essential for fighting the increasing number and speed of threats. The Nortel Switched Firewall combines high-speed switching with the Check Point Firewall engine to

produce the first accelerated firewall solution. Similarly, the Threat Protection System provides intrusion prevention by combining strong alerting and management capabilities with Snort, an open source network intrusion prevention system.

Nortel Secure Information Access Solution:

The Nortel Secure Information Access Solution offers more than just mobility. It helps to ensure that the remote and internal networks protect organizational information across untrustworthy network segments and meets new, tough security legislation.

Secure Information Access:

- provides secured access to the corporate network for mobile, remote and home-based employees regardless of location
- enables use of kiosk, mobile, and PDA technologies for data access
- builds on public networks for business partner connectivity
- helps to ensure connected systems meet the organization security policy
- lowers network costs and improves reliability by reducing the number of network devices, management, and training costs
- helps to ensure regulatory compliance by keeping internal and external communication content private

Features and Benefits

Feature	Benefit
IPSec and SSL in a single platform	• Reduces Total Cost of Ownership (TCO), management hours, and network complexity.
Industry-leading intrusion prevention	• Lowers management costs by automated response capability, early warning of attacks, and improved response capability. The Nortel Secure Information Access solution is based on industry-leading Snort intrusion detection system that provides updates for new attacks before any other IDS or IPS vendor.
Nortel Secure Network Access	• Confirms connected systems comply with security policies before they connect to the network using the Nortel Tunnel Guard technology.
Open Standards implementation	• Allows customers to deploy partner products and achieve other solutions, such as DataPower XML Security Gateways. Open-standards implementation enables lower integration costs and few interoperability problems.
Consistent VPN secured access	• Allows access to corporate information and applications. • Delivers a comprehensive set of VPN, security, firewall and IP services in a single, highly integrated platform. • Supports secure IP routing and WAN services for both site-to-site and remote access IPSec VPNs. • Enables customers to deploy clientless SSL VPN access for remote users, to eliminate the need to deploy a VPN client on their remote users' PCs, while building on common VPN Router administration and authentication for IPSec and SSL user access.

Switched Firewall	• Lowers capital and operational expenditures for enterprise organizations and service providers by simplifying firewall deployment and management. • Provides carrier-class security with support for multiple customer domains, multiple security domains, and multiple applications. • Allows transparent deployment into existing Check Point Firewall infrastructures, building on existing staff skills and training to implement the advanced Check Point Firewall and security management services. • Simplifies firewall and hosting infrastructures in deployment, day-to-day management, and troubleshooting.
Threat Protection System	• Detects known threats using pattern matching to expose defense weaknesses and enable administrators to take corrective actions. • Detects unknown threats through anomaly scanning to give early warning against emerging threats or malicious internal activity. • Eliminates the expense of false alarms by using a flexible rule set and administrative structure. • Maintains the most effective security posture possible through the Snort community, plus a dedicated team of security experts helps keep the network up to date on new threats and vulnerabilities. • Gains a better understanding of the network ability to protect the network based on queries, event data, and reports on threats. • Traps and traces traffic associated with any attack to analyze all critical information and formulate a response to generic or specialized attacks. • Creates an "active-response" work flow that responds immediately to block new and emerging threats or attacks by updating Switched Firewall, Router, or Application Switch rules and filters before affecting application availability or performance.

Mobility Solutions

Overview

Mobility solutions by Nortel enable the creation of a virtual enterprise by solving the challenge of anywhere, anytime accessibility that extends from the home, road, and campus to the office. Mobility solutions provide a converged and consistent user experience to real-time communications that extend into business processes such as Contact Centers and back office ERP applications.

Mobility is “virtually” looking down the hall and seeing that a peer is available to assist you; a mobility solution must have a “people contact” component. The Nortel superior real-time IP communications capabilities include telephony, Presence, Call Management, Unified Messaging, and Collaboration to seamlessly match individual “people-to-people” and “people-to-group” needs. Nortel is the only enterprise vendor that provides all of the pieces needed to design the most appropriate mobility solution, such as WiFi, mesh, WiMax, cellular, wired, and multimedia applications.

The mobility solutions covered in the following pages include Teleworker and Road Warrior, Campus Mobile Worker, and Expert Anywhere.

Nortel is uniquely positioned to address the emerging Dual Mode market with our extensive wireless carrier and enterprise expertise. Dual Mode uses both private and public networks, allowing a single converged device to bridge Wi-Fi and public cellular domains for both voice and data communications.

Nortel continues to lead with the first WiMax implementation in Canada. The Nortel WiMax network brings wireless broadband services to rural Albertans spread across more than 8000 square miles (21 000 square kilometers) in southeastern Alberta, Canada.

The Nortel WiMax solution focuses on replacing of wired T1/E1 or DSL circuits for the last-mile connection between end-user devices or premises and the high-speed transport network. However, other potential applications include:

- wireless backhaul for WLAN hot-zone and hotspot traffic
- broadband access for small to medium-sized enterprises, as an alternative to Frame Relay or circuit services (T1/E1)
- cell site (GSM, UMTS, CDMA BTS) backhaul

The Nortel soft client strategy and partnerships with leading technology firms such as RIM (BlackBerry), Dell, and Intel continue to enable customer access to our mobility solutions on the most popular mobile devices in the market.

The collaboration between Nortel and Microsoft takes convergence another big step forward with the marriage between Outlook and MCS, giving the user one application to work from by putting MCS access on the Outlook toolbar. Enhanced contact capabilities includes: an SIP address, Presence, new sessions for calls, IM, access to call logs, and personal agent.

SIP-based Contact Center 6.0 enhances the Expert Anywhere customer experience by opening up new channels of communication and collaboration, including integrated voice, video, IM, Web collaboration, and speech.

Mobility Solutions

Nortel Mobility solutions offer:

- lower cost of ownership
- open, standards-based architecture for ease of integration
- superior overall quality of experience for end users

• Teleworker and Road Warrior	• Campus Mobile Worker	• Expert Anywhere
• Based on: • Remote Access Manager • VPN Gateways • Secure Routers • Secure Network Access • MCS 5100 and CallPilot Unified Messaging • IP Clients 11xx, 200x IP phones, 2050 Softphone, MCS 5100 (PC Client, Office Client and Wireless Client for Blackberry)	• Based on: • WLAN 2300 • Wireless Mesh Network • VoWLAN • WiMax • IP Clients 22xx • IP Phones • 2050 Softphone • MCS 5100 (PC Client, Office Client and Wireless Client for Blackberry) • CallPilot Unified Messaging • Ethernet Routing Switches • Power over Ethernet (PoE) switches • VPN Gateways • Secure Routers • Nortel Secure Network Access (SNAS) • Digital Mobility Solution (DMS)	• Based on: • Contact Center 6.0 • IP Clients 200x • IP Phones 11xx • 2050 Softphone • MCS 5100 (PC Client, Office Client, and Wireless Client for Blackberry) • Nortel VPN Gateways • Secure Routers • Nortel Secure Network Access (SNAS)

Why Nortel?

- Nortel was the first company to introduce a remote SIP-based multimedia communications server with the MCS 5100.
- More people use Nortel secure remote access clients than any other vendor with more than 100 million clients in use worldwide.
- Nortel was the first vendor to support both IPSec and SSL VPN on a single, integrated platform that allows mobile users to roam without disrupting their secure connection.
- Nortel is the first supplier with wireless networks operating in all advanced radio technologies (GSM/ GPRS/EDGE, CDMA2000 1X and 1xEV-DO, UMTS, and WLAN) and the only end-to-end provider of all next-generation wireless solutions, a leader in WLAN mesh networking, and first to offer an enterprise-scale, open-standards SIP multimedia solution.
- Nortel has designed, installed, and launched more than 300 wireless networks in over 70 countries.
- Nortel provides mobility applications and solutions to more than 160 million users.
- With Tunnel Guard, Nortel was the first vendor to support endpoint security, ensuring remote mobile users and devices comply with corporate security standards before they access the network.

The Mobility solutions and services that build Nortel expertise are:

- Teleworker and Road Warrior
- Campus Mobile Worker
- Expert Anywhere
- Planning and Design
- Installation and Integration
- Maintenance and Management
- Optimization and Evolution

Industry Needs

Hospitality

- guest demand for increased, property-wide wireless connectivity
- hotels need mobility solutions that enhance productivity of on-the-go staff and that extend across the property
- erosion of traditional service revenue including telephone charges and Internet access charges
- hotels do not have CAT5 wiring, which hampers the ability to offer high-speed Internet access to guests
- growth outside of North America by providing a very high level of use of wireless devices by guests
- profitability of service mix so that hotels can charge significantly higher rates in meeting environments than for individual guest use
- resort-type hotels need to provide both staff and guests with outdoor WLAN coverage

Health care

- doctors and nurses require mobile delivery of patient or process information on devices of their choice
- health care costs are escalating beyond funding abilities; they are driven by an aging population, expectations for improved quality of care, preventable medical errors, and other factors
- digital applications of the healthcare industry are hindered by constrained funding and adoption by individual clinics

Higher Education

- enable collaboration between students, classmates, and faculty
- meet the strong demand for wireless connectivity both indoors and outdoors
- provide secure remote access to campus portals, e-learning, and presence-based collaboration solutions
- provide a personalized communications experience for network users
- extend WLAN connectivity across growing campuses – beyond libraries and common student areas to classrooms, residence halls, and outdoor areas
- desire for a culture that enables learning and services-on-demand, which drives the need to securely open the campus to enable anytime, anywhere learning experiences
- IT funding rated the number one IT concern on the Top Ten List of Higher Education Issues (EDUCAUSE 2005 Survey)
- opportunities for new revenue generation and value delivery
- campuses need to deliver new innovation to recruit new students and attract and retain top faculty

K-12 Education

- provide more students and teachers with access to computer resources
- create a safe learning environment that allows quick response to emergencies
- allow parents to become actively involved in the learning process to support their child's success
- support student success with increased parental involvement
- manage classrooms and teacher productivity
- share teaching talent across a learning district

Finance

- mobile staff, calling officers, and outside sales force must be more productive and responsive to high-value clients
- staff collaboration between back office, branch, and field staff is inhibited by awkward and expensive conferencing tools
- limited real-time access to decision makers and expertise
- proliferation of communications devices with limited integration
- pressure to increase employee productivity
- inadequate front-line sales training and coaching

Teleworker and Road Warrior Solution

Overview

Nortel provides teleworkers and road warriors alike with secure, consistent access to their corporate networks, along with the ability to collaborate in real time with their peers, management, and customers when they work from home or on the road.

This combination of secure information access and real-time collaboration provides:

- improved speed for decision-making, project startup, and delivery
- simplified access to people and expertise
- reduced duplication of effort and repeated mistakes

Nortel is the only vendor that delivers end-to-end, secure mobile access technologies coupled with a collaborative people contact application (SIP-based MCS 5100) to enterprise customers. This powerful combination delivers the employee productivity and customer service improvement levels that enterprise customers want from a mobility solution.

Ideal For

- Teleworkers require secure, reliable remote access to connect to their corporate applications and the ability to collaborate with their colleagues.
- The road warrior community requires secure access to the corporate network from unpredictable locations and on a variety of devices
- Businesses must deal daily with access security, firewall issues, support of multiple applications, various types of bandwidth, and Quality of Service (QoS) issues.
- Companies must manage multiple clients, including desktop clients, VPN clients, and more; therefore, employees need a consistent workplace experience across multiple device and access types.
- Employees need ways to improve the employee's work-life balance and to retain their high performers.
- Employees need to collaborate with their colleagues, suppliers, and customers in real time for improved staff efficiency with a positive impact on the customer.

Business Challenges

- What percentage of your workforce travels? How does your traveling workforce stay connected today?
- Does your business have employees who work from home or other remote or branch locations? Have you considered how to help

them stay connected and accessible?

- Do you have a multibuilding campus that requires improved accessibility for users on the go? How can improved accessibility change your business?
- How is your company keeping pace with the increasing need to work virtually?
- What are some common complaints from mobile workers and IT support about lack of consistent service and experience?
- Are your employees using instant messaging, e-mail, or cell phones to collaborate? If so, are the tools secure? Are the tools integrated?

Nortel Solution

The pivotal element of this solution is the Multimedia Communications Server (MCS) 5100 SIP-based collaborative application. The solution comprises the following Nortel components:

- Security products (Remote Access Manager, Nortel VPN Gateway and Nortel Secure Router, and Secure Network Access).
- Multimedia applications MCS 5100 (PC Client, Office Client, Wireless Client for BlackBerry) and Nortel CallPilot Unified Messaging.
- IP Clients (200x IP Phones and 2050 Softphone).
- Global Services for Enterprise Mobility Portfolio (Consulting and Operational Services).

Features and Benefits

Feature	Benefit
Remote Access Manager (Hosted Remote Access Service with open access Graphical User Interface)	Reduces risk and increases confidence in exchanging sensitive business communications by providing controlled access to information for remote users and limiting the type of information any one individual has access to from anywhere at any time.
Nortel VPN Gateway Secure Router (SSL and IPSec), Secure Network Access	- Provides a flexible, simple, browser-based solution (SSL) for end users. - Reduces costs to manage remote access VPN deployments by allowing businesses to negotiate the most economical service provider (ISP) access contracts while controlling their own access framework. - Seamlessly swap access providers based on price and performance, or both, without affecting end user experience, as the customer is no longer captive to one particular provider access manager.
Multimedia Applications MCS 5100	- Speeds up time-to-market with real-time collaboration and communications, enabling fast decision making, project startup, and delivery. - Reduces conference call expenses using VoIP with laptop client versus calling cards or toll-free numbers. - Delivers a seamless telephony experience with single-number access to users. Desktop phone, laptop client, PDA client, and cell phone can be managed through a user's Personal Agent that routes communications based on the user's preferences to improve employee satisfaction associated with work flexibility. - Allows fast responses to customer inquiries. - Enables users to tailor their communications flow to fit their work style using the solution robust features. - Provides seamless, converged desktop experience with Microsoft Outlook plug-in for MCS 5100.
Unified Messaging CallPilot	- Provides a unified, single interface to retrieve voice, fax, and e-mail messages. - Simplified, flexible access to messages using the telephone interface, a Web browser, a PDA or from within a familiar e-mail client.
IP Clients 200x IP Phone, 2050 Soft Phone, MCS 5100 (PC client, Wireless Client for the BlackBerry)	- Offers flexibility in client options and feature integration between desk phone and PC. - Transforms laptop or desktop PC into a mobile, converged voice and data communications platform. - One telephone number for office phone and PC client to deliver constant, consistent access outside of the office. - BlackBerry devices and other PDAs become interactive communications tools that perform collaboration functions that streamline business and keep users in touch (secure IM, Presence, and Click-to-Call, route preferences).
Global Services for Enterprise Mobility Portfolio	- Nortel Global Services assists customers and channel partners throughout the life cycle of the mobility solutions described above. - Many services exist within the Mobility Services portfolio to assist customers with network planning and design, installation and integration, maintenance management, and security and, ultimately, the optimization and upgrading of their Nortel environment.

Campus Mobile Worker Solution

Overview

The Nortel Campus Mobile Worker solution enables employees and visiting business partners the freedom to roam from floor to floor, to nearby buildings, or to hot spots and maintain access to corporate applications and communication services. The solution also allows users to remain accessible and collaborate in real time with peers, management, and customers while on the move.

Nortel is the only enterprise vendor that provides both secure mobile access and the people contact to help ensure workers can make fast and accurate decisions, thereby improving their efficiency and customer responsiveness while roaming about a facility.

Ideal For

- Businesses must deal daily with access security, firewall issues, support of multiple applications, various types of bandwidth, and Quality of Service (QoS) issues.
- Companies must manage multiple clients, including desktop clients, VPN clients, and more; therefore, the employees need a consistent workplace experience across multiple device and access types.
- Companies need to improve staff accessibility and efficiency while raising the level of customer satisfaction and loyalty.
- Businesses need to reduce operational expenses, for example, cell phone expenses by putting voice on a data network using Voice over Wireless LAN (VoWLAN).
- Campus settings drive the need to provide seamless indoor and outdoor network accessibility.

Business Challenges

- Do you have a workforce or constituents that are constantly on the move within large open areas?
- Are there large open areas where you want wireless access but where cabling is prohibitive?
- Do you have environments where it is difficult to install Ethernet jacks (student classrooms or warehouses where floor layouts are often rearranged)?

- Are excessive business cell phone and pager charges by your employees increasing your operational expenses?
- How do you plan to secure the wireless access to network resources?
- Is voice quality a critical element to your business processes and worker productivity?
- While deploying a fully converged network with mobility in mind, do you want the migration path to monitor, measure, and set multimedia application performance?

Nortel Solution

The pivotal element for this solution is WLAN technology. The solution comprises of the following Nortel components:

- Wireless products (Wireless Mesh Network, WiMax, WLAN 2300, VoWLAN).
- Multimedia applications (MCS 5100 [PC Client, Office Client, Wireless Client for BlackBerry], CallPilot Unified Messaging).
- Power-over-Ethernet-enabled Ethernet Switches (Ethernet Switches and Ethernet Routing Switches) to power wireless access points.
- Security products (VPN Gateways and Endpoint Security with the Nortel Secure Network Access solution).
- Global Services for Enterprise Mobility portfolio (lifecycle services and hosted and managed services).

Features and Benefits

Feature	Benefit
Wireless Solutions Indoor WLAN Access—WLAN 2300	• Provides network access coverage through shared access to the network without adding more physical installations. • Optimized to run high-quality voice and multimedia applications. • Simplified implementation and smooth scaling with Plug-and-Play access points and products designed for branch office, wiring closet, and data center installations. • Seamlessly integrates with existing networks and security, to provide strong security, performance, and service resiliency. • Strong user management allows time-expired user accounts for visitors, along with per-user identity and time-of-day-based network access policies. • 802.11i support and security capabilities to find and thwart rogue access points to mitigate unauthorized access. • Service resiliency without single point of failure.
Outdoor or Large open space WLAN Access –Wireless Mesh	• Peer-to-peer infrastructure to backhaul data wirelessly to a wired network, providing wireless access to areas not covered by traditional WLAN solutions (outside campus, public venues). • Enterprises can reduce capital costs associated with installation and reduce the time required for deployment by 30 to 50 percent over traditional WLAN solutions.
WiMax	• Aimed at Metropolitan Area Networks (MANs), WiMax is an emerging wireless broadband technology that delivers broadband multimedia data ubiquitously over wireless links at several times the speed of traditional circuit-switched wireless systems. • Greater capacity and distance capabilities than today's WLAN access solutions, such as the 802.11-based WiFi and Wireless Mesh technologies. • WiMax is the most cost-effective solution, providing consumer broadband services in rural and other underserved markets. • WiMax is a cost-effective wireless backhaul solution for WiFi, Mesh, and Cellular Networks.
VoWLAN	• Provides all features and functionality of an IP desk phone. • Rapid on-campus communications with Push-to-Talk and two-way text messaging integrates with other enterprise communications systems to provide mobile workers with access to critical information. • Soft clients are also available for devices such as RIM BlackBerry, Dell Axim, HP iPAQ, and Toshiba WiFi PDAs.
IP Clients 11xx, 22xx IP Phone, 2050 Softphone, DMM3100 (Dual Mode Handset)	• Increases customer choice with an expanded line of Nortel IP Phones • Enables advanced communication and information exchange. • Uses a variety of soft clients available for laptop, pocket PC, or BlackBerry cellular/WiFi handhelds. • WLAN 2212 Handset has built-in VPN Client • 1100 series IP Phone includes high-resolution graphical display. • DMM 3100 Common (WLAN/WWAN) user interface with extensive functionality including unified call logs, personal directory, optional VPN Client, Call Hold, Transfer, and Conference, supported on MCS 5100, CallPilot Unified Messaging, and more.

Feature	Benefit
Global Services for Enterprise Mobile Extension Services	• Mobile Extension Services (also known as Mobex) enable all incoming and outgoing calls to go through corporate PBX to enable easy billing and access to corporate communication services. • Mobex features available on traditional, single-mode mobile phones (for example, GSM phones), and on new smart phone devices such as BlackBerry or other devices with a built-in operating system.
Global Services for Enterprise Digital Mobility Solution (DMS)	• Offers a low-cost wireless voice handset solution for Norstar or BCM customers. • Improves productivity through better information flow and reduced idle time • Enhances customer service through improved response time.
Multimedia Applications MCS 5100 (PC Client, Office Client, Wireless Client for BlackBerry)	• Speeds up time-to-market with real-time collaboration and communication through: –improved staff efficiency –easy access to people and expertise –decreased duplication of effort and repeated mistakes –fast response to customer inquiries • Improves employee satisfaction associated with work flexibility. • Enables users to tailor communications flow to fit their work style. • Allows users to see who is available through the Presence feature, which improves access and communication among employees. • MCS client for BlackBerry provides integrated solution for cellular and WiFi BlackBerry devices. • Provides seamless, converged desktop experience with Microsoft Outlook plug-in for MCS 5100.
Unified Messaging CallPilot	• Offers a one-stop shop to retrieve of voice, fax, and e-mail messages. • Delivers access from multiple interfaces and devices, telephone interfaces, Web browsers, or an e-mail client. • Consolidates multiple communications services under one client to improve ease of use.
Security Solutions Secure Remote Access – Nortel VPN Gateway and Secure Router (SSL and IPSec)	• Reduces risk and builds confidence in exchanging sensitive business communications. • Reduces costs of managing remote access VPN deployments. • Provides a flexible, simple, browser-based solution (SSL) for end users.
Ethernet Switches Gigabit Power over Ethernet ERS 470-PWR and 5520-24/48T-PWR	• Power over Ethernet support for IP Clients, Wireless Access Points, network cameras, and more. • High-density gigabit desktop connectivity capable of delivering superior performance at half the price of the competition.
Global Services for Enterprise Mobility Portfolio	• Nortel Global Services assists customers and channel partners throughout the life cycle of the mobility solutions described above. • Many services in the Mobility Services Portfolio assist customers with the planning and design of their networks; the installation and integration; the maintenance management and security; and, ultimately, the optimization and upgrading of their Nortel environment.

Expert Anywhere Solution

Overview

The Nortel Expert Anywhere Solution makes it possible for companies to reach experts across an organization to expand the pool of customer service agents without the high cost of maintaining centralized and regional contact centers or setting up expert knowledge workers as formal contact center agents.

Expert Anywhere Solution brings together the new innovative Nortel Contact Center 6.0, the Presence and real-time collaborative capabilities of SIP-based Nortel MCS 5100, a diverse portfolio of Nortel IP Phones and clients, and secure remote access with Nortel VPN Gateways to provide agents with the resources they need to deliver first-time call resolution every time.

Ideal For

Expert Anywhere Solution enables:

- Instantaneous collaboration and communication with an expert worker anywhere in the organization, thanks to tools like Meet-Me Conferencing, videoconferencing, application sharing and remote control, white boards, and CallPilot Unified Messaging.
- A choice of communications, phone, instant messaging, video, e-mail, so users do not have to worry how agents, experts, and customers connect.
- Reduced training requirements and a lower investment in new agents with specialized skills.
- Greater customer satisfaction and, in turn, repeat business that ultimately improving the company's bottom line.
- Contact center agents have only a brief, one-time opportunity to impress their customers by exceeding customer expectations.
- Companies need to improve staff efficiency, decrease the number of redundant activities, and elevate the levels of customer service while reducing overhead costs.
- Contact centers struggle with increasing call volumes, but don't have the budget to hire more agents.
- Not every contact center agent can be an expert on everything, so they need to rely on others to get the answers but the right person is not always available or easy to track down.
- Because of high turnover, contact centers spend great amounts of money on hiring and training; they need to find ways to encourage their employees to stay, such as flexible work hours and teleworking.

- To attract the best people, companies need to have state-of-the-art contact centers equipped with the tools agents require to do a good job and provide a superior customer experience.

Business Challenges

- How do your agents collaborate with co-workers and subject matter experts who work from remote locations today? Have you considered how to help them stay connected and accessible in real time?
- Have you considered how to deliver multimedia applications to agents at remote sites or home-based offices without incurring significant costs?
- What if you can capitalize on the expertise of a distributed workforce and extend the hours of service covered by your contact center?
- Do you have a plan in place or have you considered how to improve the productivity and collaboration of your agents in order to reduce call hold times and abandoned call rates?
- Are your employees using instant messaging, e-mail, or cell phones to collaborate? If so, are the tools secure? Are the tools integrated?

Nortel Solution

Expert Anywhere Contact Solution comprises the following Nortel components:

- Nortel Application Center (Contact Center 6.0)
- Multimedia applications (SIP-based multimedia collaborative application – MCS 5100)
- IP Clients (200x IP Phone, 2050 Softphone, and MCS 5100 3.5 client)
- Security solutions (VPN Gateways)
- Global Services for Enterprise Mobility Portfolio (lifecycle services, hosted, and managed services)

Features and Benefits

Feature	Benefit
Contact Center 6.0	• Offers an integrated suite of contact center solutions with a full range of functionality, including inbound and outbound voice, multimedia (e-mail, text chat, and video), and computer telephony integration (CTI). • Opens new channels of communication and collaboration with your customers. • Integrates voice, video, IM, Web collaboration, and speech. • Offers advanced mobile 3G services. • Provides video kiosks. • Makes hold time productive with new media services. • Delivers dynamic, seamless, secure representative-assisted self-service capabilities enhanced with personal touches. • Less costly to implement and manage than nonintegrated solutions from multiple vendors. • Provides revenue-generation services while enhancing the customer experience with Outbound Campaign Manager feature. • Delivers robust, reliable security features. • Offers TDM, IP, or SIP-based platform for inbound and outbound voice, multimedia, e-mail, text chat, fax, and Web collaboration with integrated CTI.
Multimedia Applications SIP-based multimedia collaborative application—MCS 5100	• Allows skills-based routing, reporting, and management of multiple contact channels by opening multimedia queues (inbound and outbound voice, e-mail, text chat, fax, Web, and video). • Provides powerful features such as Presence and media adaptive collaboration tools that significantly enhance user productivity and interaction with colleagues anywhere for fast decision making and improved customer responsiveness. • Reduces conference call expense by using VoIP with laptop client. • Provides a seamless telephony experience with single number between desktop phone and PC client. • Enables fast and comprehensive responses to customer inquiries. • Allows users to tailor their communications flow to fit their work style using the robust features.
IP Clients 200x IP Phone, 2050 Soft Phone, MCS 5100 3.5 client	• Increases customer choice, thanks to an expanded line of Nortel IP Phones. • Enables advanced level of communication and information exchange. • Uses a variety of soft clients available for laptop, pocket PC, or BlackBerry cellular, and WiFi handhelds. • Enhances BlackBerry PDAs with multimedia capabilities such as IM, Presence, and Click-to-Call. • 1100 series IP Phone includes high-resolution graphical display for productivity-enhancing converged applications. • 2007 IP Phone delivers access to multimedia-based content such as Web pages, still frames, and streaming video presentations.

Security Nortel VPN Gateway, Secure Router (SSL and IPSec)	• Reduces risk and increases confidence in exchanging sensitive business communications. • Provides a flexible, simple browser-based solution (SSL) for end users. • Extends the reach of enterprise applications and resources to remote employees, partners, and customers. • Builds on native capability of widely deployed Web browsers and SSL VPN. • Supports IPSec-based VPN clients. • Reduces costs of managing remote access VPN deployments.
Global Services for Enterprise Mobility Portfolio	• Nortel Global Services assists customers and channel partners throughout the life cycle of the mobility solutions described above. • Many services exist within the Mobility Services Portfolio to assist customers with the planning and design of their networks; the installation and integration; the maintenance, management, and security; and, ultimately, the optimization and upgrade of their Nortel environments.

Multimedia Communications Solutions

Overview

Within enterprises, the value of a converged network has evolved beyond simply delivering network connectivity and cost-reducing consolidations. Now, convergence occupies a strategic role—one that simplifies business processes, drives innovation, and enables new opportunities for revenue generation.

Businesses around the world want converged IP networks to deliver the enhanced competitive advantages of real-time communications: voice, video, and multimedia applications that are available instantly, anywhere, and on any device. Nortel Multimedia Communications Solutions deliver an end-to-end portfolio of IP infrastructure solutions tailored for the Campus or the Branch Office, as well as multimedia applications for improved competitive customer engagement and enhanced worker productivity.

These solutions are built with proven Nortel products that support:

- a broad suite of world-class business telephony features
- award-winning Nortel applications, including the Nortel Application Center with IP Contact Center, Self-Service, Unified Messaging, and SIP-based collaborative multimedia communications
- a highly available converged network infrastructure underpinned with industry leading security and management capabilities
- gigabit Power over Ethernet (PoE) that can deliver twice the performance at half the price of the competition
- flexible communication systems that encompass full TDM, IP-enabled, and full IP

Nortel is uniquely positioned as the only vendor that provides a single source for IP infrastructure, emerging multimedia applications that run on it, and the security solutions and know-how to protect these converged networks. A customer cannot deploy new IP-based voice and data services with no solutions to secure and streamline those services. Nortel understands this fact and delivers security and management solutions as an integral part of our overall converged solution.

Today's convergence customers face many challenges:

- cost controls can no longer improve their bottom line, so organizations want technological innovations to drive increased productivity and business growth
- workers need better tools to collaborate and communicate with a dispersed workforce and deliver superior customer care
- IT groups need to develop and maintain a secure network environment, meet regulatory compliance requirements, and ensure appropriate security policies and best practices
- globalization of companies, plus an increase in distributed workers and remote offices, is creating new challenges for running an integrated organization

The Solution

Nortel Multimedia Communications Solutions encompass all aspects of convergence, not just voice and data, but applications and services as well. Businesses can implement convergence confidently, because Nortel Multimedia Communication Solutions are built on a converged infrastructure that provides superior investment protection, interoperability, reliability, and security, without tradeoffs in features and functionality. Nortel Multimedia Communications Solutions deliver powerful capabilities that focus on these key areas:

- **Converged Infrastructure:** boosts a customer's competitive advantage by streamlining network infrastructure and reducing operational costs.
- **Converged Applications for Employee Productivity:** enables business growth and innovation with communication applications that support a more productive workforce.
- **Converged Applications for Customer Satisfaction:** provides reliable access to rich multimedia tools that help create a responsive, engaged experience for customers.
- **Nortel Multimedia Communications Solutions** will continue to demonstrate Nortel's leadership and innovative strength building on cutting-edge SIP-based technologies, powerhouse partnerships with companies like Microsoft, and the ability to simplify network complexity and streamline business processes with advanced multimedia applications that fuel the business transformation of today's real-time collaborative enterprise.

Why Nortel?

- **Goldsmith Agio Helms – Investment Banking Firm:** created a competitive advantage by establishing a policy to return customer calls within 30 minutes, 24 hours-a-day, seven days-a-week, all year long. The solution saved employees 10 to 20 minutes each day, which equals \$173 000 to \$345 000 annually in productivity dollars.
- Seventy-eight percent of CIOs and IT executives surveyed rate improving employee productivity as "vitally important" or "very important" to business growth and success (Nemertes 2005).
- The number of virtual office workers has increased by 800 percent over the past five years (Nemertes 2005).

Industry Needs

Hospitality

- A need to compete with nontraditional distribution channels, for example, online merchants such as Travelocity and Orbitz, to offer the lowest-priced services.
- A need for differentiated approaches to engaging guests both before and during travel to build brand loyalty.
- Erosion of traditional service revenue, including telephone charges and Internet access charges, lowers profit ratio.
- Growth in global markets technologically intelligent consumers.
- Cost reduction is critical for profitability.

Health care

- Legislated requirements for retention and protection of patient records.
- Health care solutions must allow patient data and clinical information to be secure and immediately available at the points of diagnosis and care.

Government

- State and local governments must align their IT agenda with the federal government agenda.
- Traditional model of the jurisdiction-by-jurisdiction or agency-by-agency IT approach leaves a legacy of duplicate applications and technologies that become difficult to sustain.
- Government IT organizations are hampered by job reductions and changing skill sets required to deploy e-government applications and other new technology programs.
- Pressing need to improve the quality and the speed of decision making by improving information sharing between levels of government, especially in public safety and Homeland Security areas.

Higher Education

- Students want a flexible, convenient, collaborative learning environment.
- Higher education is increasingly competitive because e-learning breaks down geographic barriers and creates increased competition for students.
- Funding IT is a challenge, so improving efficiency and reducing costs is critical.
- Traditional telephony service revenues have eroded and a critical need exists for new revenue-generating solutions.
- Attracting and retaining students and recruiting top-notch faculty and researchers calls for continuous innovation.

K-12 Education

- Pressures to do more with less are increasing, and stretching available financial and human resources is a priority.
- Funding IT is a challenge—capitalizing on available sources of government funding, reducing total cost of ownership (TCO), and increasing return on IT investment is critical.
- Teacher professional development is a priority that requires ongoing effort and investment.
- Engaging technologically intelligent students requires continuous innovation and strategic deployment of IT.

Finance

- Upgrade the network infrastructure to reduce costs and transform the local office to enable the organization to expand beyond traditional services and fulfill a wide range of sales and service roles.
- Increase efficiency and improve the alignment of network infrastructure with business goals.
- Avoid duplicating resources such as call centers, data centers, and multiple networks resulting from merger and acquisition activity.
- Increase network availability and enable rapid recovery from any natural or non-natural disaster.
- Long lead times, due to lack of network flexibility, hampers the deployment of new locations, services, or applications.

Multimedia Applications Solutions

Overview

Nortel Multimedia Applications Solutions encompass all aspects of convergence, not just voice and data, but applications and services as well. Businesses can implement convergence confidently, because Nortel Multimedia Applications Solutions are built on a converged infrastructure that provides superior investment protection, interoperability, reliability, and security, without tradeoffs in features and functionality. Nortel Multimedia Communications Solutions deliver powerful capabilities that focus on three key areas:

- **Converged Infrastructure:** boosts a customer's competitive advantage by streamlining network infrastructure and reducing operational costs.
- **Converged Applications for Employee Productivity:** enables business growth and innovation with communication applications that support a more productive workforce.
- **Converged Applications for Customer Satisfaction:** provides reliable access to rich multimedia tools that help create a responsive, engaged experience for customers. Nortel Multimedia Applications Solutions continue to demonstrate Nortel's leadership and innovative strength in leveraging cutting-edge SIP-based technologies, powerhouse partnerships with companies like Microsoft, and the ability to simplify network complexity and streamline business processes with advanced multimedia applications that fuel the business transformation of today's real-time collaborative enterprise.

Ideal For

Today's convergence customers face many challenges:

- cost controls can no longer improve their bottom line, so customers need technological innovations to drive increased productivity and business growth
- workers need powerful tools to collaborate and communicate with a dispersed workforce and deliver superior customer care
- IT groups need to develop and maintain a secure network environment, meet regulatory compliance requirements, and ensure appropriate security policies and best practices
- globalization of companies, combined with an increase in distributed workers and remote offices, creates new challenges for running an integrated organization

Business Challenges

- How would optimizing network performance at your branch offices improve the collaboration and efficiency of your workforce?
- If your employees were able to make decisions more quickly and effectively, how would that affect your business?
- What if you could reduce your organization's travel and outsourced conferencing costs?

- How much do you typically spend on employee training annually?

Nortel Solution

The Nortel Multimedia Applications solution drives powerful, new applications that can boost a customer's competitive advantage, reward the customer with an increasingly productive workforce, and help the customer to create a responsive, engaged experience the end customers. The Nortel Multimedia Applications solution combines converged infrastructure, converged platforms and converged applications into one single solution.

Businesses can implement convergence confidently because Nortel Multimedia Communications solutions are built on a converged infrastructure that provides superior investment protection, interoperability, reliability, and security without tradeoffs in features and functionality.

Nortel products that make up Multimedia Applications solutions include:

- Communication Server 1000 (CS1000) Portfolio
- Multimedia Communication Server 5100 (MCS 5100)

- Nortel Applications Center and IP Contact Center Solutions
- Ethernet Routing Switch 8600 (ERS 8600)
- Wireless LAN
- VPN Routers and Firewalls
- IP Phones and Clients

The Multimedia Applications solution comprises the following components:

- Nortel Applications Center
- Nortel Contact Center 6.0
- Converged Office Solution

Nortel Applications Center

The Nortel Application Center combines contact center, advanced speech, CallPilot Unified Messaging, and multimedia collaboration into a cohesive application environment. This combination delivers an easy-to-use customer experience and increased profitability for the businesses that it serves. This platform ultimately integrates previously stand-alone applications into a seamless user experience across multiple applications, with common management tools and standard reporting modules at a fraction of the cost of today's independent systems.

The Nortel Applications Center provides an open application environment that uses standards such as Session Initiated Protocol (SIP), VoiceXML, and CCXML to offer businesses superior flexibility. The Center delivers numerous benefits. For example, customers can implement one application, or the entire suite, based on their current requirements. Then, they can easily deploy additional modular applications on an as-needed basis by simply installing them.

As well, integration capabilities and flexible deployment options in the applications suite will further reduce complexity, maintenance, and total cost of ownership (TCO). High-quality applications can be delivered quickly due to a single set of familiar standards-based tools for designing, developing, and testing applications.

Nortel Contact Center 6.0

Contact Center 6.0 is a comprehensive suite of open, SIP-based contact center and self-service solutions, combined with the real-time collaborative multimedia capabilities available on the Nortel Multimedia Communication Server 5100 (MCS 5100). The feature-rich solution offers an all-in-one single architecture that includes anywhere licensing, as well as a flexible administration and management environment that allows managers to adapt quickly the contact center to diverse customer needs. The solution transforms the customer contact experience by supporting integrated TDM, IP, or SIP-based multimedia applications and services that foster collaboration with an extended community of experts to help ensure that customer problems are solved and decisions are made faster and more effectively.

Converged Office Solution

To further extend our leadership in SIP applications and real-time communication services, Nortel recognizes the need to drive open SIP interoperability with other industry leaders. As part of our commitment to open SIP communications, Nortel teamed with Microsoft to combine the respective industry leaders in business-grade telephony solutions and desktop applications to deliver a powerful and integrated converged office experience. The Nortel Converged Office solution integrates the advanced telephony features of the Nortel Communication Server 1000 with the Microsoft Live Communication server (the lead instant messaging and presence server) and Microsoft Communicator client.

Specifically, the Converged Office Solution enables users to make and receive calls through their Microsoft Communicator client with a consistent feature set and dialing plan and capitalize on these telephony capabilities in conjunction with the ability of Microsoft to provide instant messaging and user presence within Microsoft Office and Microsoft Outlook applications. Users can preserve their

investments in existing telephone sets and soft phones. Additionally, the Converged Office solution combines with the power of the Nortel Applications Center to further integrate Nortel multimedia applications with the Microsoft desktop environment to drive improved customer satisfaction and productivity.

The Converged Office solution builds on the previously announced Nortel open SIP applications initiatives, such as the Multimedia Office Client plug-in for Microsoft Outlook 2003. As a plug-in to Outlook 2003, the Multimedia Office Client provides access to Nortel MCS features, including the ability to control Nortel 200x IP Telephones for integrated speakerphone, mute, and hold; use existing business telephone systems for voice with Nortel converged desktop technology; and support service interworking with other MCS clients. These clients include the Multimedia PC client, Multimedia Web client, and Multimedia wireless clients (handheld devices).

Multimedia Infrastructure Solution

Nortel's Multimedia Infrastructure solution drives powerful, new applications that can boost a customer's competitive advantage, reward them with a more productive workforce, and help them create a responsive, engaged experience for customers. Nortel's Multimedia Infrastructure solution brings converged infrastructure, converged platforms and converged applications together into one single solution.

The Nortel Multimedia Infrastructure solution comprises the following products:

- Business Communication Manager
- Nortel Secure Routers
- MCS Client
- VPN Client
- Nortel Ethernet Switch 460-PWR
- Nortel Survivable Remote Gateways
- Nortel Ethernet Routing Switch 8600 series
- Communication Server 1000 (CS1000) Portfolio
- Multimedia Communication Server 5100 (MCS 5100)
- Communication Server 2100 portfolio
- Nortel Ethernet Routing Switch 5500 (ERS 5500)

- Nortel VPN Routers
- IP Phones and IP Clients

The solution comprises the following components:

- Converged Branch Office Solution
- Adaptive Clients

Converged Branch Office Solution

With the strategic acquisition of Tasman Networks, Nortel strengthened its position as an innovator in providing resilient end-to-end converged multimedia networks. Ideal for converged enterprise branch, remote, or regional site environments, the Nortel Secure Router portfolio provides the low-latency, high-packet throughput required by IP telephony and multimedia applications. Nortel Secure Routers deliver full routing and multicast services, and can run numerous services such as voice, VPN, firewall, and quality of service (QoS) simultaneously with wire-speed performance across a distributed converged branch office environment.

Nortel Secure Router 1000 series

This series delivers fast, secure, reliable, and scalable wide area network (WAN) T1/E1 access for enterprises. These powerful platforms provide consistent high-speed throughput with no degradation in performance, even with advanced services enabled. Ideal for installation in enterprise remote sites and branch offices, the Secure Router 1000 series combines high performance and a robust feature set, which makes the series an extraordinary value.

Nortel Secure Router 3120

This router is a powerful modular system that converges routing, security, and multimedia traffic forwarding in a single cost-effective platform. Delivering fast, secure, reliable, and scalable wide area network (WAN) access, the Secure Router 3120 is perfect for enterprises that need high-speed IP or Internet access. By combining high performance, robust routing, and flexible WAN connectivity, the Secure Router 3120 targets large branch and regional enterprise environments.

Adaptive Clients Solution

The need for collaborative real-time business communications from a broad choice of adaptive clients is imperative to employee productivity and enhanced customer responsiveness. Nortel expands the portfolio of adaptive clients supported by Nortel Multimedia Communication Solutions with the IP Phone 1100 series, a new generation of clients that act as "portals" for application delivery from the network. Whether for a converged campus or

branch office environment, Nortel's IP Phone 1100 series offers users a sleek, innovative, ergonomic design with an array of new business telephony features, high-resolution graphical displays, and support of Web-based or XML applications delivered from the Nortel Application Gateway 1000 or an External Application Server. The IP Phone 1100 series phones are SIP ready and offer support of a native SIP stack upon availability with a future firmware download.

Features and Benefits

Feature	Benefit
Communication Servers BCM, CS1000, CS2100	• Scalable, reliable, full-featured IP telephony with over 600 IP telephony features, no single point of failure, power fail bypass, multiple tiers of optional redundancy, and scalable deployments for small to large distributed enterprises.
Survivable branch IP telephony, Survivable Remote Gateway (SRG) 50	• Seamlessly extends users in small, remote offices, to enable a consistent user experience regardless of a user's location.
CallPilot Unified Messaging through Nortel application Center, Nortel Messaging	• Offers a single message access point from a variety of devices for voice, fax, and e-mail messages. • Ensures security and privacy. • Nortel Messaging combines voice mail, fax, and e-mail into a single location that can be accessed from anywhere, whether over the Internet or by telephone. • Enables the mobile worker to remain engaged with e-mail by phone and speech-activated messaging (SAM). • Allows access to voice and fax messages from mobile e-mail enabled devices such as PDAs.
SIP-based multimedia collaborative application, MCS 5100	• Improves communication by delivering presence and collaborative applications, collaboration features to distributed and mobile workers. • MCS 5100 including secure instant messaging, click-to-call, route management, and more. • Media conferencing including voice, video, and application sharing reduces travel costs and downtime while improving the interaction and problem resolution practices of voice-only communications.
Media-rich IP Clients IP Phones 200x, 11xx, 2050 Softphone, WLAN 22xx	• Increases user choice to maximize productivity. • Enables enhanced ease of use from advanced ergonomic design. • Provides an easily accessible portal to converged applications. • Delivers service ubiquity, so users get convenient, consistent access to call and messaging features. • Connects directly to Ethernet LANs, and can be managed from a central operations center, so on-site visits are not required to add or change features and users. • Can be used in a TDM environment to enable transitioning to VoIP at pace designated by customer.

Ethernet Routing Switch and Ethernet Switch	• Business continuity from gigabit switching for the LAN, which is designed for delay-sensitive, jitter-sensitive applications—perfect for the QoS demands of IP telephony. • Provides power to IP phones over Ethernet links. Phones are guaranteed to be operable during power outages with power delivered from a central switch and backed up by UPS.
Power over Ethernet, ERS 5520	• PoE support for Voice over IP Handsets, Wireless Access Points, network cameras, and more. • High-density gigabit desktop connectivity. • Delivers twice the performance at half the price of the competition.
Secure Routers	• Wire-speed performance, even with small packet sizes and network services enabled. • Deliver low-latency, high-packet throughput optimal for VoIP and multimedia transport. • Include a wide array of integrated capabilities, such as IPSec, VPN, stateful firewall, built-in Ethernet ports, and CSU/DSU and drop/insert (DSX-I) voice support, eliminating the need to purchase extra equipment to support additional services.
Secure Network Access Switch	• Delivers endpoint security by enabling only trusted, sole-based access privileges premised on the security level of the device, user identity, and session context. • Offers the most effective, scalable, and cost-efficient endpoint security and policy-compliance solution across LAN, WLAN, WAN, and VPN networks.
Secure Multimedia Controller 2450	• Provides a secure multimedia zone. • Enables attack protection. • Ensures privacy with signaling path encryption. • Improves resiliency. • Simplifies management.
Self-Service Automated Speech	• Self-service platforms provide a range of solutions that enable multimedia transaction processing for small to large solutions enterprises as well as service providers. Based on an open, flexible, and modular design, our scalable solutions connect over a wide variety of protocols and databases on various networks to ensure interoperability with a customer's current network environment. • Speech solutions empower your customers to complete complex self-service transactions by speaking naturally without the assistance of a live agent; our speech solutions include the latest generation of speech recognition technologies open standards such as VoiceXML/CCXML and SIP-based services that deliver an enhanced customer experience.
Proactive Voice Quality Management (PVQM)	• Quality of Experience (QoE) monitoring of Management (PVQM) IP telephony traffic. • Performs health checks of IP telephony servers. • Identifies network faults or performance degradation.
Network and Policy Management	• Streamlined management that provides comprehensive network and security management for an enterprise to provision and maintain service levels while ensuring network-wide security policies.

Small- to Medium-Sized Business Solutions

Overview

Small and medium businesses (SMBs) worldwide face similar challenges. They need to cost-effectively build and manage a communications infrastructure capable of meeting today's telephony and data challenges, yet they must also make sure that their communications systems can scale efficiently to support tomorrow's application and business growth requirements.

From infrastructure to applications to services, Nortel offers proven, award-winning voice and data solutions that meet the needs of small and medium-sized businesses (SMBs). Nortel SMB solutions are not simply scaled-down versions of larger enterprise products; they are designed specifically to meet the unique requirements, challenges, and price points of small businesses.

With award-winning products that meet voice, converged infrastructure, mobility, remote working and security needs, Nortel is uniquely positioned to provide comprehensive communications solutions for small and medium businesses of all types.

By offering this market many of the same robust communications technologies and capabilities previously available only to large enterprises, SMB owners can expect significant business benefits, including:

- reduced costs and operational expenses
- gained competitive advantage
- more efficient communications with employees, partners, and customers
- improved productivity
- high levels of customer service

At the same time, Nortel SMB solutions address key concerns of small and medium business owners, such as:

- affordability: Nortel SMB solutions offer exceptional functionality while meeting SMB pricing and ROI models
- simplicity and manageability: Nortel SMB solutions are designed to be easy to deploy and manage
- reliability: unsurpassed reliability guards against downtime and service disruptions
- compatibility and investment protection: Nortel SMB solutions are open-standards based, and easily integrate and operate with equipment from most manufacturers

Nortel is ranked number one globally in total system shipments of key, PBX, and IP telephony systems (Dell'Oro). Our experience in delivering communications solutions to SMBs is also unmatched, with small businesses worldwide relying on more than one million Nortel systems each day.

The SMB solutions portfolio components include:

- Nortel Business Communications Manager (BCM)

- Nortel Wireless LAN (WLAN)
- Nortel Ethernet Switch portfolio
- Nortel Secure Router portfolio

Why Nortel?

The Business Communications Manager is the cornerstone for Nortel SMB solutions. The BCM50 in particular has accumulated a number of awards and recognition:

- BCM50, the market-leading, all-in-one, affordable converged voice and data communications solution for small to medium-sized business and branch offices, was named 2005 Product of the Year by Internet Telephony magazine.
- BCM50 supports Nortel's focus on, and commitment to, the small and medium-sized business and branch office space by providing customers with the most groundbreaking small-site solution since Norstar.
- BCM50 was named as a finalist for 2005 Product of the Year Award from Small Business Technology Magazine, an award that salutes innovative technology solutions that boost the productivity and profitability of small businesses.
- BCM50 hit the 10 000 unit sales milestone five months after its launch. Exceeding forecast and expected demand, this 10 000 unit sales landmark speaks to the excitement and market fit of the product.

Nortel SMB Support Services offer unique maintenance service options for our small and medium-sized business customers. As SMB customers invest in converged technologies, new service challenges are arising, such as supporting complex network configurations, solutions-based support, and limited customer technical expertise. This support service addresses customer needs by providing a differentiated service experience, which covers Nortel voice, data, and converged technologies, at a favorable price point. Nortel offers two distinct contracted maintenance offerings designed specifically for the SMB market: SMB Technical Support with Next Business Day (NBD) Spares Service or SMB Technical Support with Next Business Day (NBD) Spares and On-Site Labor Service. These two cost-effective support options meet our SMB customers' business requirements, as well as ensure the reliability and performance of their communications networks.

SMB Solutions

Overview

SMB solutions from Nortel fall into six categories:

- converged voice and data
- telephony
- mobility
- data networking
- security
- support services

All of the SMB solutions are supported by a broad managed services portfolio.

Solution Categories

Solution	Based on
Converged Voice and Data	• Business Communication Manager (BCM) 50, BCM 200/400 • CallPilot Unified Messaging, Interactive Voice Response, and Contact Center • Increases productivity and improves customer service • IP phones, 2001, 2002, 2004, and 2007
Telephony	• Norstar Integrated Communications Systems: 3X8, CICS, MICS CICS, MICS • CallPilot Unified Messaging, Interactive Voice Response, Contact Center • Business Series Terminals T7100, T7316E, T7208, T7406, T24 Key Indication Module
Mobility	• Digital Mobility Controller 080/320 • Digital Mobility Handsets 7420, 7430, 7440 • WLAN 2300 series
Data Networking	• Ethernet Routing Switch 3510 • Ethernet Switch 325, 425, and 460
Security	• VPN Router series 200 and 1000
SMB Support Services	• SMB Technical Support with Next Business Day (NBD) Spares Service • SMB Technical Support with Next Business Day (NBD) Spares and On-Site Labor Service

Converged Voice and Data Solution

Overview

Small to medium businesses that are ready to increase their competitive edge with converged voice and data networking solutions need look no further than Nortel. As a leader in convergence, we help businesses worldwide reduce communication costs, simplify administration, increase employee productivity, and enhance customer service.

Business Challenges

- Have you considered the cost savings to converge your voice and data traffic onto a single network?
- Do you know how converged networks reduce operating expenses and enable new productivity-enhancing applications?
- Do you want ways to cost-effectively increase bandwidth at the desktop to enable new applications?
- Do you spend a lot of time making moves, adds, and changes (MAC) to your network?

Features and Benefits

Feature	Benefit
BCM50 An award-winning, fully integrated, converged communications solution for small to medium businesses with 3 to 20 stations—scalable to more than 40	• Provides sophisticated capabilities such as robust telephony features, Unified Messaging, contact centers, IP telephony, IP networking, and Internet access at an affordable price. • Gives users a choice of an IP-enabled or pure-IP strategy by supporting analog, digital, and IP phones. • Increases productivity and improves customer service. • Lowers installation and maintenance costs with simple browser- and client-based management.
BCM200/400 A scalable, converged voice/data solution designed for small to medium-sized businesses (200+ stations)	• In addition to the benefits provided by BCM50, BCM200 and BCM400 offer powerful business communications, including multimedia contact center, interactive voice response, and IP routing—as well as data services such as firewall, wireless, and more.
Contact Center 6.0	• Skills-based routing makes it quick and easy for customers to have questions answered by the appropriate individual.
Interactive Voice Response (IVR)	• Enables customers to access information 24/7 by automating tasks.
Nortel CallPilot Unified Messaging	• Converges voice, fax, and e-mail messages onto users' PCs, making it easy to manage all types of messages from a single desktop application.
Automated Attendant	• Answers calls 24 hours a day, seven days a week with a personalized greeting and routes calls to appropriate departments or individuals.
Computer Telephony Integration (CTI)	• Enables PC-based applications to work with telephone services, such as automatically populating the screen display to show customer account information, or click-to-call with company directory, which helps deliver a personalized service to customers.

Telephony Solution

Overview

The full line of Nortel telephony products enables everything from additional, advanced voice mail features to IP telephony adoption. An SMB customer can migrate to new technology at a pace appropriate for their business. The Nortel industry-leading Norstar telephony product is on the desks of more than 15 million SMB owners and employees in more than 80 countries around the world.

Business Challenges

- Are you concerned with the cost and time involved in training employees to use their telephones and telephony features?
- Do you want your receptionist to spend more time providing value-added services instead of merely directing calls?
- Do your employees spend a lot of time juggling between voice messages and e-mails?
- Have you considered the ways applications such as contact centers can help your business save and even make money?
- Did you know that you could now afford many of the same communications tools and applications that large businesses use?

Features and Benefits

Feature	Benefit
Norstar Integrated Communications Portfolio is a fully digital platform that combines all communications, including voice mail, fax, and e-mail, to the desktop	• Offers the track record of a proven and reliable solution with more than one million systems sold in over 80 countries. • Ideal for up to 192 stations and scalable up to 248 ports. • Advanced integrated applications, including enhanced contact centers and computer telephony integration (CTI), can be easily added to increase productivity and improve customer service.

Complementary Business Applications

Contact Center 6.0	• Makes it quick and easy for customers to have questions answered by the appropriate individual (using skills-based routing).
Nortel CallPilot Unified Messaging	• Converges voice and e-mail messages onto users' PCs, making it easy to manage all types of messages from a single desktop application.
Automated Attendant	• Answers calls 24 hours a day, 7 days a week with personalized greeting and routes calls to the appropriate departments or individuals.
Computer Telephony Integration (CTI)	• Enables PC-based applications to work with telephone services, such as automatically populating the screen display to show customer account information, or click-to-call with company directory, which helps deliver a personalized service to customers.

Mobility Solution

Overview

Nortel mobility solutions provide employees with the freedom to be productive throughout the workplace. Flexible wireless LAN solutions provide the same voice, data, and multimedia applications available on a traditional LAN over a wireless network. Digital Mobility Solutions for BCM and Norstar ensure fast, easy access to people and data, regardless of worker location, through the use of cordless handsets. For more information, see the Mobility Solutions section in this Guide.

Business Challenges

- Would your employees be more productive if they made and received phone calls while away from their desks?
- Are there areas where you want outdoor wireless access, such as gathering places or cafeteria seating?
- How many of your employees need to move freely throughout the workplace to perform their work?

Features and Benefits

Feature	Benefit
Digital Mobility Solution for Norstar and BCM200/400 (includes controllers, base stations, repeaters, and 7420, 7430 and 7440 handsets)	• Offers a low-cost in-building wireless solution for Norstar and BCM customers. • Improves business flexibility with cost-effective voice mobility. • Makes employees more accessible by "untethering" them. • Provides mobility throughout a campus environment. • Seamlessly extends features and applications with digital mobility, making it easy to switch between desktop and wireless handsets.
WLAN 2300 series — an 802.11 wireless solution that enables mobile voice and data capabilities while building on existing LAN infrastructure	• Provides a mobile worker with laptop wireless access to the same applications as a desk-bound PC user. • Eliminates a potential single point of failure • Prevents applications from dropping through roaming applications.

Data Networking Solution

Overview

Nortel data networking solutions provide cost-effective bandwidth to keep business-critical applications running—now and into the future. All Nortel data networking products improve communications investments by delivering greater performance and more capabilities than competing products.

Business Challenges

- Are you concerned about the increasing complexity of your network and how to manage it?
- Did you know that Nortel offers solutions that can save, and even make, you money, without needing to replace your existing network (assuming it is properly engineered)?
- Do your employees need to share software applications, printers, modems, fax machines, and software?
- Can your network address today's increased demands and still prepare for the unknown demands of tomorrow?

Features and Benefits

Feature	Benefit
Ethernet Routing Switch 3510: high performance, gigabit desktop connectivity	• Supports the ever-growing bandwidth requirements of voice and other mission-critical applications by using highly cost-competitive Ethernet switching with QoS.
Ethernet Switch 325: desktop switching	• Provides cost-effective, easy-to-use desktop connectivity through simplified setup and Web-based management tools.
Ethernet Switch 425: scalable desktop switching	• Delivers "pay as you grow" desktop connectivity for growing businesses at an affordable price.
Ethernet Switch 460: scalable, resilient desktop switching with QoS and Power over Ethernet (PoE)	• Enables desktop connectivity plus power for devices such as IP phones and wireless access points, which reduces wiring requirements and costs, and simplifies employee moves.

Security Solution

Overview

There is a lot at stake for small to medium-sized businesses when it comes to security. That is why data and network protection is so important to SMB owners. Nortel Virtual Private Networking (VPN) solutions provide secure remote access, so your customers can be confident that their networks are protected, no matter from where people log in.

Business Challenges

- Do your employees often work after hours, require flexible working hours, and work on the road or from home?
- What percentage of your employees are home-based or teleworking, and how do you support them today?
- Do you consider security as part of your IT strategy?
- Do you restrict access to some business applications?
- How does your business respond to a security attack?

Features and Benefits

Feature	Benefit
VPN Router 200 series (model 221): Provides telecommuters and small offices/home offices with VPN, stateful firewall, URL/content filtering, and optional integrated ADSL.	• Delivers low-cost, secure connectivity to the Internet or managed IP networks. • Extends VPN security and cost savings to SMBs. • Saves space with its compact form factor. • Offers easy installation and management.
VPN Router 1000 series (models 1010, 1050, and 1100): Provides integrated IP routing, VPN, firewall, encryption, and authentication to fulfill SMB security and connectivity needs	• Delivers cost-effective, integrated security and connectivity. • Lowers costs through secure VPN tunnels between sites. • Enables enhanced employee flexibility for work locations and hours using secure connectivity for home (or elsewhere). • Requires no changes to network, workstations, applications, or operating systems, so it is easy to deploy. • Offers high-end software and administration in a small, low-cost package.

Support Services Solution

Overview

Nortel SMB Support Services offer unique maintenance service options for small and medium business customers. As SMB customers invest in converged technologies, new service challenges arise, such as support complex network configurations, solutions-based support, and limited customer technical expertise. This support service addresses customer needs by providing a unique service experience that covers Nortel voice, data, and converged technologies at a favorable price. Nortel offers two distinct contracted maintenance offerings designed specifically for the SMB market: SMB Technical Support with Next Business Day (NBD) Spares Service or SMB Technical Support with Next Business Day (NBD) Spares, and On-Site Labor Service. These two cost-effective support options meet our SMB customers' business requirements and help to ensure the reliability and performance of their communications networks.

NORTEL
GLOBAL
SERVICES GUIDE

Global Services

Overview

Throughout the life cycle of a network solution, the professional or consulting services portion can cost as much as five to ten times the amount of the actual hardware and software. Real costs, such as installation and maintenance, only scratch the surface of the total price a customer must pay to run their environment. Hidden costs—downtime, decreased productivity, or lost opportunities that arise from the inability to integrate technologies and practices effectively—are all significant challenges to an organization.

Nortel Global Services for Enterprise offers practical solutions to these challenges. And those solutions work—over 80 percent of Nortel customers use our services. When customers adopt a solution, they want:

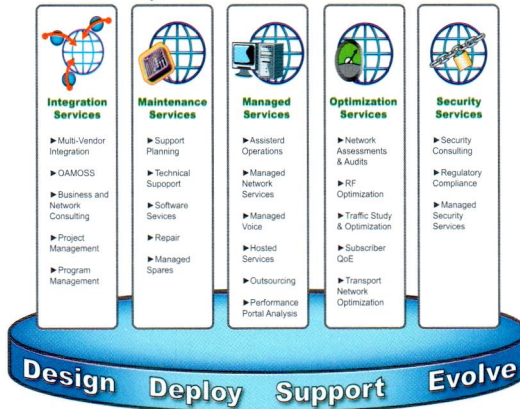
- **Vendor accountability:** Customers want their primary vendor to support their services and network life cycle by standing behind the products and services they deliver.
- **Single contract support agreements:** Customers cannot accept multiple vendors supporting their network environment; they demand a single point of contact and a single contract locally, nationally, or globally.
- **Ease of doing business:** Customers need a vendor to be accessible and with whom it is easy to do business.
- **Network expertise:** Customers want access to the intellectual property, tools, and support staff that service providers offer.
- **Performance management:** Customers demand a vendor that commits to their successes and shares in the risks associated with supporting large networks.

Global Services for Enterprise delivers on all these demands—and more.

In today's world of consolidation, increased security and high demands for cost cutting, Nortel Global Services can provide a complete range of life cycle services to support new network deployments or existing infrastructures. The Nortel goal is to increase a company return on investment by integrating, supporting, managing, securing, and optimizing multivendor network equipment. This is realized through a dedicated team of service professionals around the globe that drive services solutions customized to satisfy the unique business needs of a company and to deliver the services with high quality.

The Nortel Global Services are bundles of service modules combined with project management to provide businesses with a complete solution for a particular network need. Nortel can customize and price services packages according to the unique business needs of a company. By combining several services modules into packages of service solutions, Nortel can help businesses acquire integrated and custom services, while maintaining the maximum competitive pricing and delivery models. With services packages, businesses continue to maintain the overall support of their networks and use Nortel Global Services for those areas that are either not the core competency of the business or for where a vendor-driven solution is better suited.

Global Services offerings



Nortel offers a number of global services, including:

- **Integration services (expected Q3 2006)**

Integration services help ensure a timely and project-driven installation and integration of new technologies into your current network. These services include project and program management, network and application integration planning, site audit and preparation, staging and preconfiguration engineering, cabling, implementation and deployment, test and verification, and site reconfiguration.

- **Maintenance services**

Maintenance services throughout the life cycle help to maintain and secure your network environment. Services in this segment include repair and maintenance services, managed parts, on-site technicians, remote technical support, software support, and update services.

- **Managed services**

Managed services throughout the life cycle of the network help to maintain and secure the network environment. Services in this segment include network services, maintenance services, VPN services, and security services.

- **Optimization services**

Optimization services maximize your current network investment and help ensure you drive the performance, productivity, and reliability of your network to extend the useful life of your network. Services include RF optimization, network performance optimization, performance and capacity management, remote upgrade support, traffic study and optimization network, and system upgrades and migration, audits, and assessments.

- **Security services**

Security services meet the changing security needs of Nortel customers. Secure networks involve three major components: people, processes, and technologies. Our services help our customers with the technology component and offer assistance with the users, user policies, and processes,

such as the design of effective security policies or the ability to comply with industry regulations. Services in this segment include professional security consulting, security compliance, managed security, and custom-built Security Operations Centers.

Business Challenges

Today's carrier and enterprise customers face many unique challenges. As a provider of communications services to its subscribers, and internal and external customers, a company must address the following essential issues:

- **How do you focus on core objectives and reduce risk?**

Driving down operations expenses and reducing your total cost of ownership are imperatives if you are to provide your users with the new technology demands they require. Nortel Global Services complete range of life cycle services solutions enable you to focus on your core competencies while reducing your overall network life cycle support costs.

- **How do you transform and evolve your network?**

Enhancing collaboration and deploying new technologies and applications requires that you constantly prioritize and refocus your team of network professionals. Nortel Global Services, through advanced services such as network optimization, enable you to meet your critical project deadlines without investing in new personnel, support technology, or tools.

- **How do you secure your network?**

Today's converged networks are especially vulnerable to sophisticated attacks. Maintaining your customer's data privacy, reacting quickly to network break-ins or virus attacks, and helping to ensure that you meet the regulatory requirements placed upon you with the limited resources at your disposal can be a daunting task. Nortel Global Services provides a complete set of security services to ensure your network performs flawlessly under any attack.

- **How do you improve performance to your customer base?**

Reducing the response time for your customers, implementing new technologies, and linking tools and processes are challenging requirements for today's network professionals. Nortel Global Services, through a series of advanced services that enhance your current network as well as ensure new networks are designed and deployed effectively, enable you to increase your performance as quickly as possible while limiting new investments.

Why Nortel?

Nortel Global Services has an unmatched support team with thousands of focused services people providing global coverage and regional service solutions throughout the life cycle of your network.

Today, Nortel Global Services supports many of the world's largest communication networks and provides direct global services solutions for Fortune 500 companies, telecommunications carriers and, through relationships with Nortel Business Partners, enterprise customers with 20 to 50 000 users.

Quality is a key driver in all we do, and Nortel Global Services has many industry-recognized certifications such as TL-9000 and ISO-9001, as well as an internally driven quality management process to help ensure consistent service delivery in all locations.

Nortel Global Services provides support for over 50 percent of the Fortune 100 organizations in the U.S. today. In addition, we provide multivendor managed services to more than 100 of the largest and most sophisticated enterprises and service providers in the world, using 600 managed services professionals in network management centers in Raleigh, NC, Rochester, NY, and London, UK. If required, Nortel can provide detailed information about specific successes that match your unique requirements.

Availability of Services

Nortel can provide solutions to these customer challenges through the following Global Services:

	NA	EMEA	CALA	APAC	GC
Maintenance Services	√	†	√	†	†
Managed Services	√	√	√	√	√
Optimization Services	√	†	†	†	†
Security Services	√	†	†	†	†

†Same services but specific contents and service levels can vary in this region.

Ordering Information

For further information, contact your Nortel representative.

Nortel Maintenance Services

Overview

Nortel Maintenance Services provide you with the ease of a single point of contact to support your multivendor network with flexible maintenance plan options tied to service level agreements (SLA). Nortel Maintenance Services are available for:

- technical support services
- repair services
- managed spare services
- managed onsite with spare services
- software services

Business Challenges

Not only are you faced with continually changing and converging technologies, but how do you support the combination of these technologies from multiple vendors to ensure your network performs reliably? You might question:

- How do I get competitively priced service solutions for my new products?
- How do I get a single point of contact to support my multivendor network?
- How do I get proactive support on my maintenance agreement?
- How do I get reliable support for my network tied to a Service Level Agreement (SLA)?

Nortel Solution

Nortel Maintenance Services provide a single point of contact to support of your multivendor network with flexible maintenance plan options tied to SLAs. You get the support services and priority you need depending on criticality to your business. So reduce your capital and operating costs by complementing or supplementing your internal staff with our Maintenance Services for service providers and enterprises.

Services

Nortel offers the following services:

- **Technical Support Services**
Includes emergency recovery 24 hours a day, 7 days a week, 365 days a year, technical support during local business hours, and access to our Web-based Service Request Tool and Knowledge Solution Engine.
- **Repair Services**
Includes your choice of Repair Services level along with emergency recovery 24 hours a

day, 7 days a week, 365 days a year, technical support during local business hours, and access to our Web-based Service Request Tool and Knowledge Solution Engine.

- **Managed Spares Services**

Includes your choice of Managed Spares Services level along with emergency recovery 24 hours a day, 7 days a week, 365 days a year, technical support during local business hours, and access to our Web-based Service Request Tool and Knowledge Solution Engine.

- **Managed Onsite with Spares Services**

Includes your choice of Managed Spares Services level with a Spares Onsite trained technician, along with emergency recovery 24 hours a day, 7 days a week, 365 days a year technical support during local business hours, and access to our Web-based Service Request Tool and Knowledge Solution Engine.

- **Software Services**

Includes Release Subscription Service to make sure your network remains current and simplifies management of software upgrades at a predictable cost.

Benefits

Competitively priced service solutions for new products reap the benefits of competitive, custom pricing solutions for your unique business needs that can support the entire life of your network. Forecast and budget maintenance expenses rather than pay yearly fluctuating amounts while you reduce other

administrative costs incurred with a per-incident billing method.

Single point of contact for your multivendor network capitalizes on Nortel expertise, multivendor relationships, and vendor management resources to gain a single point of contact for your multivendor network. Depend on consistent support at customer locations around the world with Nortel infrastructure and economies of scale.

Proactive support on your maintenance agreement helps to ensure immediate technical response through our proactive network monitoring

and support services. Expedite problem resolution through our Web-based Service Request Tool and Knowledge Solution Engine.

Reliable support for your network tied to an SLA lets you choose what is best for your business based on internal resources and criticality of the network to your businesses with maintenance offers ranging from basic break or fix support to complete outsourced network support. Performance management agreements and committed response times can be customized to the unique needs of your business.

Availability of Services

Nortel can provide solutions to these customer challenges through the following Maintenance Services:

	NA	EMEA	CALA	APAC	GC
Technical Support Services	√	†	√	†	†
Repair Services Pack	√	†	√	†	†
Managed Spares Services Pack	√	†	√	†	†
Managed Onsite with Spares Services Pack	√	†	√	†	†
Software Services	√	†	√	†	†

†Same support plans and support packs but specific contents and service levels can vary in this region.

Ordering Information

For further information, contact your Nortel representative.

Nortel Managed Services

Overview

Managed Services increase return on investment, reduce costs, and ensure consistency while customers manage rapid technology changes with Nortel Global Services multivendor, multitechnology, managed, hosted, and outsourced network services. These services complement a customer's existing network operations center (NOC) staff or provide a complete outsourced solution.

Business Challenges

Every day you face new business issues. Key challenges exist that continue to inhibit your business goals:

- How do you reduce operating costs?
- How do you smoothly migrate to new technologies easily?
- How do you gain the convenience of a single point of contact for the services you need to operate and support your network?
- How do you extend the life of your network and maximize performance?

Nortel Solution

Nortel Managed Services address evolving business models and changing network management requirements with flexible support options for enterprises, carriers, and cable companies:

- Managed Network Services
- Managed Maintenance Services
- Managed VPN Services
- Managed Security Services

Nortel Managed services provide complete support for the life cycle of the network. Nortel Managed Services can:

- Lower and distribute costs by eliminating the need for additional IT staff by replacing them with an outsourced service that charges a flat monthly fee.
- Increase return on investment by maximizing the life of the solution.
- Decrease risk and offer peace of mind so customers can focus on core competencies and business.

Services

Nortel offers the following services:

- **Managed Network Services**
Focus on strategic initiatives for your business while Nortel experts provide

centralized multivendor network monitoring and reporting around the clock, after business hours to support existing staff, or for disaster recovery only. Choose from simple network monitoring and reporting to event management, fault management, performance and capacity monitoring, and analysis.

- **Managed Maintenance Services**

Efficiently operate your network for the long term by getting the skilled resources you need with Nortel on-site field maintenance experts. Nortel's experience with multivendor hardware and software troubleshooting and testing networks for enterprise and carrier help to maximize network performance; while Nortel's experience helps to ensure fast resolutions to your problems.

- **Managed VPN Services**

Get an end-to-end VPN solution with Nortel Managed VPN Services, which offer prequalification, coordination, and acquisition of T1, DSL, and cable services on your behalf, as well as the procurement of the associated equipment. This equipment is staged and delivered according to your specifications, and after you install it, Nortel can remotely monitor for faults and outages as well as provide maintenance services.

- **Managed Security Services**

Managing security functions in-house requires access to ongoing training, the right tools to warn of the latest threats, a secure Network Operations Center, and round-the-clock staffing. Capitalizing on a trusted partner such as Nortel can reduce your costs by as much as 75 percent.

Benefits

The benefits of choosing Nortel include:

Reduce operating costs: Manage your network cost-effectively on a per-network element basis by using Nortel strategically located network management centers around the world. These centers are staffed by more than 600 dedicated, trained, and experienced service professionals who manage voice, data, and converged networks for enterprise and carrier customers on a 24-hour-a-day, 7-day-a-week basis. Relying on Nortel professionals eliminates the need to build or expand Network Operations Center facilities, to train staff on new technologies and Operations Support System (OSS) platforms, or to recruit skilled staff.

Migrate to new technologies easily: Put your trust in staff that has the latest technological expertise due to the tight alignment and ready access that the Nortel network management center team has to new multivendor product

technologies. You gain the efficiencies of the new technology or go to market quickly with minimal risk. Also consider Nortel to operate your legacy network to maximize your capital investment while you prepare to convert to a next-generation network. You enjoy service quality that is consistent and repeatable due to industry-compliant processes throughout the Nortel global network management centers.

Gain the simplicity of a single point of contact: Operate your network with a single support agreement for your life cycle services, including the management of our best-in-class partners while providing global coverage.

Extend the life of your network and maximize performance: Take advantage of Nortel expertise, resources, and Web-based performance services to operate your legacy network and maximize performance while preparing it to convert to a next-generation Managed VPN Services network when the time is right.

Availability of Services

Nortel can provide solutions to these customer challenges through the following Managed Services:

	NA	EMEA	CALA	APAC	GC
Managed Network Services	√	√	√	√	√
Managed Maintenance	√	†	√	†	†
Managed VPN Services	√	†	†	†	†
Managed Security Services	√	†	†	†	†

†Same support plans and support packs but specific contents and service levels can vary in this region.

Ordering Information

For further information, contact your Nortel representative.

Nortel Optimization Services

Overview

Nortel Optimization Services extend the life of the network, reduce OPEX, and extend return on investment as customers prepare for new technology or drive their network to peak performance. These services address to five key areas using a three-step approach of Assess, Analyze, and Optimize to provide answers to customer challenges for network life cycle extension, emerging applications and technology readiness, IP packet data efficiency, VoIP/IP telephony quality of service (QoS), and readiness of voice, video, and data convergence.

Business Challenges

Every day, you face new business issues. Key challenges exist that continue to inhibit your business goals:

- How do I extend the life of my network?
- How do I realize maximum performance from my network?
- How do I evolve my network to support business growth?
- How can I improve my VoIP and IP Telephony customer quality of experience?

Nortel Solution

Nortel uses a three-step approach to provide the answers to customer challenges and to help ensure thoroughness and maximum value return:

1. Assess

Perform a thorough assessment of the present state of your network, considering such things as application performance, network configuration, transport, access, and multivendor interoperability.

2. Analyze

Use the data from the initial assessment to perform an in-depth analysis to identify specific areas of focus. Further analysis of these focus determine a best-practices strategy.

3. Optimize

With focus areas identified, develop an implementation strategy with you to ensure the best level of execution and achievement of optimal results.

The portfolio focuses on addressing five key areas to provide solutions to customer challenges:

- network life cycle extension
- emerging applications and technology readiness

- IP packet data optimization
- VoIP and IP telephony quality of service
- voice, video, and data network convergence readiness

Services

The Optimization services Nortel offers are:

- **Traffic Study and Optimization Services** provide expert analysis, assessment, and recommendations required for optimal network capacity and coverage.
- **Network Assessment and Audit Services** provide a variety of network assessments and audits specific to the enterprise to enable sound decisions in the future.

Benefits

The benefits of collaborating with Nortel include:

- **Extends the life of the network:** By optimizing the performance of the existing network architecture, you can extend the life-cycle of current capital expenditures, and maximize the value of current CAPEX.
- **Maximizes network performance:** Apply proven processes for network optimization to address network capacity and performance concerns and help to ensure your networks operate at maximum efficiency.
- **Eases upgrade and evolution to new technologies:** Ease the introduction of new data services or additional voice capacity by having an optimally performing network, while advanced simulation tools and expertise help determine how network and application changes affect the network before implementation.
- **Improves performance to the customer base:** Increased network performance drives sales, increases revenue opportunity, and improves the end-user's Quality of

Experience (QoE). Benchmarking your services against other operators provides knowledge to offer competitive, best-in-class service. In addition, experience improves Web application efficiency, decreases downtime, reduces operating costs, and enhances productivity.

The Nortel "one-stop shop" can help you improve your overall bottom line, increase productivity, and prepare for emerging technology deployments. The one-stop shop is for everyone, including the small business owner, the large enterprise, the regional service provider, the global carrier network provider, and government. Our objective is to partner with you to deploy new services and features that create additional revenue opportunity and ignite global commerce.

Availability of Services

The following services provide the means by which Nortel addresses these areas, using a three-step approach:

- 1. Assess the present state of the network.
- 2. Analyze in-depth to identify specific areas of focus.
- 3. Devise an implementation strategy to achieve optimal results.

	NA	EMEA	CALA	APAC	GC
Traffic Study and Optimization Services	√	†	†	†	†
Network Assessments and Audits	√	†	†	†	†

Ordering Information

For further information, contact your Nortel representative.

Nortel Security Services

Overview

Nortel Global Services offers a suite of security services that meet the changing security needs of customers. Secure networks involve three major components: people, processes, and technologies. Our services help our customers with the technology component and offer assistance with the users, user policies, and processes, such as the design of effective security policies or the ability to comply with industry regulations. Our services span the life cycle of customer networks to support the solutions described in this section. Specifically, the portfolio covers three areas:

- Professional security consulting, from secure design and integration of VoIP, multimedia, and WLANs, to risk assessments to determine the security posture of a customer's network. We also help customers respond to incidents in case of an attack.
- Compliance services provide tools and services to help our customers reduce their compliance costs and effectively understand and remediate their compliance posture.
- Managed security services include managed VPNs, firewalls, IDS/IPS, and content security services. Nortel custom designs Security Operations Centers to meet our customers' needs.

Business Challenges

Today's organizations—enterprises, small or medium businesses, service providers, and cable companies—face a number of challenges that cost revenue, productivity, and in some cases, brand equity and customers.

- How can I implement new services and converge my network securely?
- How do I adhere to industry regulations and corporate guidelines?
- How do I manage the complexity of security in my multivendor, multisolution network?
- How do I protect my customers and my business from the various network threats?

Nortel Solution

Nortel Security Services provide flexible options so you can reduce operational and capital costs, reduce your risks, and release your resources for maximum efficiency. You can manage some parts of your network while getting professional assistance and cost savings with other security functions. You can focus your IT staff on particular areas of in-house security expertise while getting professional assistance in areas where you choose not to retain and foster in-house expertise.

Based on our expertise in building some of the world's largest networks, the Nortel Security Services portfolio provides security services to both enterprises and services providers.

Services

Security Compliance Services

The productivity and real costs of complying with multiple regulations or following various industry best practices that address different industry verticals are a real concern to today's businesses.

Unauthorized data access costs a U.S. company an average of \$303 000 per breach according to the 2005 CSI/FBI Computer Crime and Security Survey (for more on the 2005 CSI/FBI Computer Crime and Security Survey, see <http://www.cpppe.umd.edu/Bookstore/Documents/2005CSISurvey.pdf>).

The business case for security services to prevent a security breach involving customer data can begin by using the following formula to determine the minimum nonpunitive cost of a single breach: $\$0.37 \times C + \$50\,000$, in which \$0.37 is the average for each piece of first-class, business-discounted presorted mailing cost, C is the number of customers in the database, and \$50 000 is the approximate cost of time and materials to write customer breach notice letters (required by law in many locations), legal expenses, public relations expenses, and mailings. The cost to mail alerts to a customer base of 140 000 customers in the target database is: $140\,000 \times .37 = \$52\,800$. Adding above ancillary costs is $(140\,000 \times \$0.37)$.

U.S.) + \$50 000 U.S. = \$101 800.

Government fines and industry penalties can result in millions of dollars more, or worse, incarceration for noncompliance. A recent industry incident cost a Fortune 500 company \$11 million in U.S. Federal Trade Commission fines alone.

Security Consulting Services

To help you address the people and processes part of your security program, Nortel provides the following:

Security Policy Review

Nortel reviews documentation relevant to your security policy, which can include:

- current, draft, or proposed security policies or procedures
- configuration standards and vendor configuration guidance documents
- formal or informal e-mail messages or memos sent to personnel that describe a policy position not documented in a formal policy
- documents with information security instructions or policy statements available only in printed form
- documentation created specifically to meet industry regulations or compliance mandates
- sample contracts used to engage contractors and third parties
- sample confidentiality agreements or nondisclosure agreements
- documentation of job descriptions, relevant security responsibilities, and standard contracts used by the company to engage any third-party information security processing facility

Managed Security Services

Managing security functions in-house requires access to ongoing training, the right tools to warn of the latest threats, a secure Network Operations Center, and round-the-clock staffing. Relying upon a trusted partner like Nortel can reduce your costs by up to 75 percent.

Custom-built Security Operations Centers

Entrusting the design and building of a Security Operations Center (SOC) to a trusted third-party benefits the company in "borrowed" expertise, fast time-to-market, and improved productivity.

Companies can then focus on either managing their SOC's to meet their own business needs or have a centralized facility offer security services to their end customers.

Benefits

The benefits of Nortel Security services include:

- **Extends the life of the network:** By optimizing the performance of the existing network architecture, you can extend the life-cycle of current capital expenditures and maximize the value of current CAPEX.
- **Maximizes network performance:** Apply proven processes for network optimization to address network capacity and performance concerns and ensure your networks operate at maximum efficiency.
- **Eases upgrade and evolution to new technologies:** Ease the introduction of new data services or additional voice capacity by having an optimally performing network, while advanced simulation tools and expertise help determine how network and application changes affect the network before implementation.
- **Improves performance to the customer base:** Increased network performance drives sales, increases revenue opportunity, and improves the end-user's Quality of Experience (QoE). Benchmarking your services against other operators provides knowledge to offer competitive, best-in-class service. In addition, experience improves Web application efficiency, decreases downtime, reduces operating costs, and enhances productivity.

The Nortel "one-stop shop" can help you improve your overall bottom line, increase productivity, and prepare for emerging technology deployments.

The one-stop shop is for everyone, including the small business owner, the large enterprise, the regional service provider, the global carrier network provider, and government. Our objective is to partner with you to deploy new services and features that create additional revenue opportunity and ignite global commerce.

Availability of Services

Nortel can provide solutions to these customer challenges through the following Security Services:

	NA	EMEA	CALA	APAC	GC
Security Compliance	√	√	†	†	†
Security Consulting	√	√	†	†	†
Managed Security Services	√	√	†	†	†
Custom-built Security Operations Centers	√	√	†	†	†

†Same support plans and support packs but specific contents and service levels can vary in this region.

Ordering Information

For further information, contact your Nortel representative.

NORTEL
PRODUCT GUIDE

Nortel SMB Portfolio

Nortel SMB portfolio offers award-winning products that meet voice, converged infrastructure, mobility, remote working, and security needs of small and medium businesses. Nortel is uniquely positioned to provide comprehensive communications products for small and medium-sized businesses of all types.

The SMB portfolio comprises the following components:

- Nortel Business Communications Manager platforms
 - Business Communications Manager 50
 - Nortel Business Communications Manager 200
 - Nortel Business Communications Manager 400
- SMB Data portfolio
- Business Element Manager
- Business Ethernet Switch 100 Series
 - BES110-24T
 - BES110-48T
 - BES120-24T PWR
 - BES120-48T PWR
- Business Access Point 120 (BAP120)
- Business Secure Router 200 series
 - BSR222

Please note: Some products included in this guide are not necessarily available to all individuals in all countries and the components and configuration of Nortel Networks solutions contained in this publication may alter from region to region. Products, specifications and availability are subject to change without notice. Please confirm all details associated with both products and solutions with your local Nortel representative.

Nortel SMB IP Telephony Platforms

The Nortel fully converged IP telephony solutions combines voice, data, and business applications into a unified platform. The Nortel Business Communication Manager platforms serve enterprises of varying sizes with IP telephony and a full complement of features and functions.

Business Communications Manager (BCM) delivers small and medium businesses and branch offices the only converged voice and data solution in the industry. This solution provides a choice of IP-enabled or pure-IP strategies. Capitalizing on existing Meridian, Norstar, and Communication Server 1000 investments, the BCM has the capabilities businesses need including telephony, unified messaging, multimedia contact centers with skills-based routing, interactive voice response, IP routing, and data services such as firewall, wireless, and more.

- Nortel SMB IP Telephony Platforms
 - Business Communications Manager 50
 - Nortel Business Communications Manager 200
 - Nortel Business Communications Manager 400

Business Communications Manager 50



Overview

The Nortel Business Communications Manager 50 (BCM50) is an affordable, complete, converged voice, data, and feature-rich business telephony applications solution for small business and enterprise branch offices with 3 to 20 stations, and is scalable to serve more than 40.

The BCM50 provides advanced capabilities such as vigorous telephony features, voice messaging, unified messaging, IP networking, Internet access, intranet access, and contact centers with skills-based routing. The BCM50 brings IP telephony to the users' desktops and offers an integrated router option for Ethernet or ADSL broadband access.

With an easy-to-use, flexible architecture, the BCM50 enables small sites to benefit from convergence capabilities that were previously available only to much larger organizations. The Nortel BCM50 system lets businesses communicate over traditional voice circuits, IP networks, or a combination of both. The unified communications platform makes network management easy and facilitates Voice over IP (VoIP) calls and IP networking between offices and can help to significantly lower operating costs and overall ownership cost.

The BCM50 is available in three configurations:

- Nortel Business Communications Manager 50: suitable for networks where integrated data routing capability is not required, or for networks that already have an IP network.
- Nortel Business Communications Manager 50e: suitable for networks where data-routing capability using an integrated Ethernet router.
- Nortel Business Communications Manager 50a: suitable for networks where an ADSL router is needed.

Ideal For

- Small and medium businesses and enterprises that want to bring the convenience of a small to medium business solution to startup or single sites, multiple sites, franchises, or branch offices (3 to 40 users).
- Businesses that want the cost advantages of an integrated solution that provides turnkey access to the Internet while protecting existing equipment investments.
- Businesses that want a solution that allows migration at their own speed to a fully-converged IP-based data and voice network.
- Businesses that want affordable, high-quality professional contact centers.
- Businesses that want mobility solutions to allow employees to remain accessible when they are away from their desks.
- Businesses that want a solution that delivers solid reliability for business-critical applications.

Business Challenges

- Do you want a solution that enables seamless communication with your clients and suppliers and still delivers on the promise of ease of management?
- Have high costs or limited feature sets hampered your plans to implement a contact center?
- Are you concerned about the lost business opportunities because you are not communicating with your clients in a way that suits them?
- Can your employees benefit from increased accessibility and freedom to work from anywhere?
- Do you want to increase revenue earning opportunities?
- Have you considered the cost savings you can realize by moving to a converged voice and data network?
- Have you considered bringing IP telephony to your employees' desktops?
- Do you want to adopt new technologies and applications at your own speed?
- Do you want a secure workplace mobility

solution to keep in touch with employees who are away from their desks?

Typical Applications

- Integrated business communications—fax, voice, voice messaging and Internet access—is available in one footprint.
- Contact center functionality allows voice-enable Web sites.
- IP telephony helps companies with multiple sites to contain network costs.
- Unified messaging creates a desktop portal for all communications, such as voice mail, e-mail, and fax.
- Computer Telephony Integration (CTI) enables applications to retrieve customer records from a database when a customer calls. CTI is the engine that drives integration with numerous third-party productivity applications.
- Mobility helps to ensure that employees can answer their phones when they are away from their desks.
- Autoattendant enables customers to reach the appropriate personnel, even when the reception desk is not staffed.
- Virtual private network (VPN) delivers the security of a private WAN over a public network.
- Telecommuters can access reliable, toll-quality telephony and applications, such as unified messaging and contact center as if they are in the head office.
- An evergreen solution protects owners' investments in hardware as they migrate to IP telephony, contact center functionality, mobile telephony, and more.

Key Points

- **IP telephony** supports powerful new e-business applications that allow small and medium businesses to level the field with larger competitors, extend network services to remote workers, increase portability, simplify additions, moves and changes (MAC), while eliminating call charges on site-to-site calls.

- **Contact center applications** combine the reach of the Web with personalized agent interaction and customer support.
- **Hybrid environment** capitalizes on existing investments in Nortel Meridian and Nortel Norstar systems as well as other vendor equipment, to offer a future-proof migration strategy.
- **Universal Internet access** allows users to access to corporate Intranets, support for intra-site virtual private networks (VPN), and remote connectivity for mobile or home users.
- **Simplified network infrastructure** cuts costs by connecting IP phones over the LAN wiring system to seamlessly extend features to multiple sites through IP connectivity and to streamline network management.
- **Wireless solutions** allow users anytime, anywhere access, the promise wireless brings: the ability to use the same applications you can access from your desktop no matter where you are.
- **Simple, intuitive management** simplifies installations and provides an intuitive way to manage the network.
- **Unified messaging** allows users to manage all their voice, fax, and e-mail messages from a single application on a multimedia-equipped PC or laptop.
- **Voice messaging** allows callers to leave important information on a mailbox for a selected user, department, or groups of users.
- **Computer Telephony Integration (CTI)** allows users to use third-party, PC-based applications to control telephone services such as a click-to-call company directory or to open a display window to show a customer's account status beside a customer's call.
- **Cost-effective scalability** allows businesses to have 3 to 40 stations using a mix of digital and IP stations.

Features and Benefits

The Nortel BCM50 is an integrated communications platform for both multiple-site enterprises and single-site small to medium

businesses. The system delivers a highly reliable, innovative, converged voice and data solution that enables a business to save money by streamlining costs and to make money by increasing revenues, expanding market reach, and improving customer service. The BCM50 delivers PBX functionality along with no-compromise voice mail and autoattendant features. Combined with robust quality of service (QoS) routing capability, the BCM50 provides a single, cost-effective solution for both data and voice needs. As businesses grow, the BCM functionality can be extended with a simple key code to deliver business-critical applications that positively affect the bottom line.

The BCM50 provides enterprise-level telephony and data services, all in an easily managed platform. From one platform, a business can cost-effectively extend its communication capabilities. The Nortel Business Communications Manager built-in routing capabilities and data services such as firewall, Web caching and network address translation (NAT) enable a business to quickly connect a LAN to the Internet, reliably and securely. The Nortel Business Communications Manager also offers an extensive range of communications application—call center, unified messaging, VPN, autoattendant, wireless telephony—all accessed by entering a key code.

The advantages of selecting the BCM50 include:

- Comprehensive solutions that are easily implemented.
- Choice of either IP-enabled or pure IP solutions.
- Investment protection because businesses can migrate without investing in new infrastructures.
- The delivery of value-added applications, such as contact center, IP telephony, voice and data networking, virtual private networks (VPNs), unified messaging, and mobility.

Nortel BCM50

- for enterprises with as few as three desktops that need a complete converged platform
- more than 44 digital telephone users
- 32 IP telephone users
- optional expansion units to add up to two media bay modules
- desk-, wall-, and rack-mount options
- three factory configurations: BCM50, BCM50e (Integrated Ethernet Router), and BCM50a (Integrated ADSL Router)

Market Information

Unlike other integrated solutions, the Nortel BCM offers PSTN fallback and more than 200 features.

- The Nortel BCM delivers the widest range of enterprise-strength applications in a single, integrated solution.
- Value-added services can be implemented with a key code rather than adding hardware.
- No competitor offers as many telephony features.
- Out of the box, BCM offers unparalleled ease of configuration and management.
- Even if the IP network or WAN stops operating, users still maintain quality call processing and get solid reliability.
- The Nortel BCM delivers convergence capabilities previously available only to large enterprises.

Technical Specifications

Platform	BCM50	BCM50a	BCM50e
Physical Specifications			
MBM (includes expansion unit)	2	2	2
CPU	PowerQuickII 5270		
Memory	256 MB of SDRAM		
Hard drive	40 G Serial ATA HD		
System Status LEDs	Status and Power		
Embedded Modem	x	x	x
Standard soft modem support on analog lines	x	x	x
Mounting Options	x	x	x
Desktop	x	x	x
Wall-Mount	x	x	x
Rack-mount	x	x	x
Dimensions	Height: 6.6 cm (2.6 in.) Width: 21.6 cm (8.5 in.) Depth: 31.75 cm (12.5 in.)		
Weight	1.8 kg (4 lb)	2 kg (4.5 lb)	
Power	External Power Supply		
Supported Telephone Sets			
IP Phones			
IP Conference phone 2033 (Rel. 2.0)	x	x	x
IP Phone 2001, 2002, 2004, and 2007	x	x	x
IP Softphone 2050	x	x	x

Platform	BCM50	BCM50a	BCM50e
Mobile Voice Client 2050	x	x	x
Digital Desktop Telephones			
T7100, T7208, T7310, T7316, and T7316e	x	x	x
T24 Key Indicator Module	x	x	x
T7406 900 MHz Cordless Telephone	x	x	x
Digital Mobility Rugged Handsets			
7420, 7430, and 7440	x	x	x
Supported Trunk Types			
Loop, E and M, DID, Ground Start T1 trunks	x	x	x
Class/CMS services	x	x	x
UK DASS2 and DPNSS	x	x	x
Euro, France, Italy, and Switzerland ISDN	x	x	x
MCDN networking (over PRI and IP)	x	x	x
PRI-DMS100/SL100	x	x	x
Q.sig networking using PRI	x	x	x
Voice Applications			
Basic Software Features	Over 400 telephony features		
Basic Call Center			
Maximum number of Active Agents	50	50	50
Maximum number of Skillsets	30	30	30
Maximum Number of Lines (trunks)	30	30	30
Recorded Announcements	50	50	50
Routing steps in routing table	20	20	20
Intelligent Overflow - Change Priorities	x	x	x
Call routing step to custom autoattendant greeting	x	x	x
Real-time status display	x	x	x
Reporting for Call Center	x	x	x
Expected Wait Time	x	x	x
Supervisor Help and Silent Monitor	x	x	x
Caller ID on agent sets	x	x	x
Agent's set forwarded to agent's mailbox	x	x	x
Autoattendant, CCR Trees			
Autoattendant	x	x	x
Centralized Autoattendant	x	x	x

Platform	BCM50	BCM50a	BCM50e
BCM-to-BCM	x	x	x
BCM-to-Norstar	x	x	x
CS1000-to-BCM	x	x	x
Park and Page from mailbox	x	x	x
Messaging			
Fully featured voice messaging with up to 1000 mailboxes	x	x	x
One hundred hours of message storage	x	x	x
Unified Messaging support for: Outlook, Outlook Express, Lotus Notes, Qualcomm Eudora Pro, Novell Groupwise, and Netscape Messenger	x	x	x
Centralized Voice Messaging - BCM-to-BCM, BCM-to-Norstar, CS1000-to-BCM	x	x	x
Fax Services			
T.38 FAX over IP	x	x	x
Fax Messaging, Fax Overflow and Fax-on-Demand	x	x	x
Voice Networking			
H.323 Gateway, H.323 v4 support	x	x	x
Communication Server 1000 H.323 or SIP	x	x	x
Meridian IP Trunk 3.01 H.323	x	x	x
CS2000 H.323	x	x	x
MCS5100 H.323 and/or SIP	x	x	x
CS1000 Signaling Server/CS1000 NRS	x	x	x
H.245 Tunneling	x	x	x
Nortel Voice Networking (MCDN) over H.323 or SIP	x	x	x
WAN Interfaces			
Ethernet WAN Interface	N/A		x
ADSL interface	N/A	x	
10/100 autosensing, autopolarity	x	x	x
LAN Interfaces			
Ethernet LAN Interfaces	up to 3	up to 7	up to 7
10/100 Auto sensing	N/A	x	x
Protocols			
IP	x	x	x

Platform	BCM50	BCM50a	BCM50e
Point-to-Point Protocol over Ethernet (PPPoE)	N/A	x	x
Routing			
Static, RIP, and RIP v2	N/A	x	x
Security and Firewalls			
Network Address Translation (NAT)	N/A	x	x
Stateful packet filtering	N/A	x	x
IPSec VPN support	N/A	x	x
Firewall Content Filtering	N/A	x	x
Firewall Management	N/A	x	x
QoS			
DiffServ marking for Media and Signaling	x	x	x
Bandwidth Management	N/A	x	x
IP Services			
Directory Name Service (DNS) proxy	N/A	x	x
DHCP Server	x	x	x
DHCP Relay Agent	N/A	x	x
Multiple IP Addresses per interface	N/A	x	x
VPN Management			
IPSec tunnels and VPN	N/A	x	x
VoIP transport through IPSec tunnels (branch-to-branch)	N/A	x	x
IPSec encryption, authentication, protocol, and NAT Traversal	N/A	x	x
System Management			
Element Manager	x	x	x
SNMP Traps	x	x	x
PAP/CHAP	x	x	x
Two-way authentication	x	x	x
Network configuration manager for multisite management and configuration of up to 2000 Nortel BCM50 nodes	x	x	x

Ordering Information

For further information, contact your local Nortel representative.

Business Communications Manager 200 and 400



Overview

The Nortel Business Communications Manager (BCM) 200 and 400 is a series of fully converged business communications systems that meet the needs of enterprises of varying sizes. These systems combine voice, data, and business applications onto a single unified solutions platform. The BCM200 and 400 deliver IP telephony and a full complement of features and functions, such as Internet access, voice messaging and contact center capabilities, as well as intuitive system management. Each server is a breakthrough solution built specifically for small to medium businesses and networked branch offices. The BCM200 and 400 enable businesses to streamline operations and achieve improved employee productivity, improved customer service, and effective and profitable relationships with clients. With the Nortel BCM200 and 400 businesses can communicate over traditional voice circuits, IP networks, or a combination. The unified communications platform makes network management easy, facilitates Voice over IP calls, and IP networking between offices. The Nortel BCM200 and 400 systems can help to significantly lower operating costs and overall cost of ownership. In addition, the Digital Mobility and Wireless LAN solutions available for the BCM200 and 400 offer cost-effective, secure mobile communications anywhere in the workplace.

Ideal For

- Small and medium-sized businesses and enterprises with startup or single sites, multiple sites, franchises or branch offices (3 to 200 users).
- Businesses that want the cost advantages of an integrated solution that provides turnkey access to the Internet while protecting existing equipment investment.
- Businesses that want a solution that allows migration, at their own speeds, to a fully converged IP-based data and voice network.
- Businesses that want an affordable, high-quality professional call center.
- Businesses that want mobility solutions to allow employees to remain accessible when they are away from their desks.
- Businesses that want a solution that delivers rock-solid reliability for business-critical applications.

Business Challenges

- Do you want a solution that enables seamless communication with your clients and suppliers and still delivers on the promise of ease of management?
- Have your plans to implement a call center been hampered by high costs or limited feature sets?

- Are you concerned about lost business opportunities because you are not communicating with your clients in a way that suits them?
- Do your employees travel and can they benefit from optimal accessibility and freedom to work from anywhere?
- Do you want to increase revenue earning opportunities?
- Have you considered the cost savings you can realize by moving to a converged voice and data network?
- Have you considered implementing IP telephony?
- Do you want to adopt new technologies and applications at your own speed?
- Do you want a secure workplace mobility solution to keep in touch with employees who are away from their desks?

Typical Applications

- Integrated business communications for fax, voice, voice messaging, and Internet access are available in one footprint.
- Call center functionality can also voice-enable Web sites.
- For companies with multiple sites, IP telephony can help contain network costs.
- Unified messaging creates a desktop portal

for all communications such as voice mail, e-mail, and fax.

- For organizations that need to retrieve customer records from a database when a customer calls, computer telephony integration (CTI) automates the retrieval process.
- Mobility ensures that employees can answer their phones when they are away from their desks.
- Autoattendant enables customers to reach the appropriate personnel, even when the reception desk is unstaffed.
- A virtual private network (VPN) delivers the security of a private WAN over a public network.
- Telecommuters can access reliable, toll-quality telephony and applications such as unified messaging and call center as if they are in the head office.
- As an evergreen solution, this platform protects owners' investments in hardware as they migrate to IP telephony, call center functionality, and mobile telephony.

Key Points

- **IP telephony** supports powerful new e-business applications that allow small and medium businesses to level the field with large competitors, to extend network services to remote workers, to increase portability, to simplify additions, moves and changes, while eliminating call charges on site-to-site calls.
- **Call center applications** combines the reach of the Web with personalized agent interaction and customer support.
- **Hybrid environment** capitalizes on existing investments in Nortel Meridian and Nortel Norstar systems as well as other vendor equipment, to offer a future-proof migration strategy.
- **Universal Internet access** provides all connected users and workstations, including access to corporate Intranets, support for intra-site virtual private networks (VPNs), and remote connectivity for mobile or home users.
- **Simplified network infrastructure** cuts costs by connecting IP phones over the LAN wiring system, to seamlessly extend features to multiple sites through IP connectivity and to streamline network management.

- **Wireless solutions deliver** anytime, anywhere access. This is the promise wireless brings: the ability to use the same applications that you can access from your desktop no matter where you are.
- **Simple, intuitive management** simplifies installations and provides an intuitive way to manage the network.
- **Unified messaging** allows users to manage all their voice, fax, and e-mail messages from a single application on a multimedia-equipped PC or laptop.
- **Interactive voice response** is a self-service application designed to allow businesses to be accessible to their customers 24 hours a day, 365 days a year. Businesses can supply callers with access to a broad range of information simply by responding to a series of prompts using their touchtone phones.
- **Cost-effective scalability supports** from 3 to 200 or more stations using a mix of digital and IP stations.

Nortel Business Communications Manager Software Release 4.0

Business Communications Manager Release 4.0 (BCM 4.0) is a software evolution for the BCM200 and BCM400 platforms. BCM 4.0 includes the following features and system performance enhancements.

The Nortel Business Communications Manager already supports many of the key activities of your organization features such as IP trunking, Call Center, Mobility and Voice Messaging, your team can provide improved customer service and achieve more every day. The introduction of the Business Communications Manager Release 4.0 (BCM 4.0) builds on previous releases to continue to deliver a global, industry-leading, enterprise solution for businesses of all types and sizes.

- **Customer service:**

Improvements to Contact Center gives small to medium businesses the same capabilities and customer service advantages as large businesses. By accommodating up to 50 skillsets, Intelligent Contact Center (ICC) maximizes the efforts of even a small number of agents to address specific customer needs. Operational efficiencies are also recognized as Custom Call Routing (CCR) helps to ensure that callers quickly reach the right person.

- **Employee productivity:**

Nortel continues to evolve BCM to help clients make the most out of every single day. When employees have the correct tools to do their jobs, they can accomplish more and focus on important matters.

Enhancements to voice mail provide improved flexibility with increases in the number of greeting tables, company greetings, Custom Call Routing Trees, and one button Park and Page. Each mailbox supports up to six telephones with a message waiting indication that makes it easy for employees who share a common mailbox to see if new messages exist. These improvements combine to reduce the number of dropped calls as tools create a direct path to the answers and information that customers need.

Conference calls are a way of life for employees in many types of businesses. With the expanded conferencing capability on BCM 4.0, up to 40 ports are available your organization can host multiple conference calls with varying numbers of participants to enable employees to collaborate more effectively. Further flexibility is available through the introduction of a New Call soft key, which allows users on a call with more than three participants to dial out and add more participants if needed.

- **Security:**

Release 4.0 introduces security enhancements in several areas of concern. Restrictions on the length, content, longevity, and repetition of passwords have become more stringent to provide maximum protection for your important corporate information. To help ensure that only approved changes are made to your network, administrators are shown data regarding their successful and failed login attempts each time they log in to alert them immediately to potential security issues. Any changes entered into Nortel Business Element Manager are tracked by BCM 4.0, so identifying who made specific changes is easy. The improvements to interface security ensure that all communications between devices are encrypted and do not cross public networks. Finally, the release of BMC 4.0 supports Remote Authentication Dial-In User Service (RADIUS) server support (4.0). Now your RADIUS system can authenticate your remote or traveling dial-in users and enable access – with no compromise to your company security policies.

- **Flexible growth support:**

Nortel solutions are designed to grow with your organization. Because as businesses grow, today's

requirements are not always the same requirements of tomorrow or next year.

- New features, such as Intelligent Contact Center (ICC), can meet changing business needs. ICC bridges the gap as it replaces Basic and Professional Call Centers. You can choose the exact number of seats and the skillsets of those seats within the boundaries of the platform. You pay only for what you use.

Features and Benefits

The Nortel Business Communications Manager 200 and 400 are integrated communications platforms for multisite enterprises and single-site small to medium businesses. Each platform delivers a highly reliable, innovative, converged voice and data solution that enables a business to save money by streamlining costs and to make money by increasing revenues, expanding market reach, and improving customer service. The BCM200 and BCM400 deliver PBX functionality along with no-compromise voice mail and autoattendant features. Combined with the robust quality of service (QoS) routing capability, the BCM200 and BCM400 provide a single cost-effective solution for both data and voice needs. As businesses grow, the BCM functionality can be extended with a simple key code to deliver business-critical applications that affect positively on the bottom line.

The BCM provides enterprise-level telephony and data services, in an easily managed platform. From one platform, a business can cost-effectively extend its communication capabilities. The Nortel Business Communications Manager built-in routing capabilities and data services such as firewall, Web caching, and network address translation (NAT) enable a business to connect a LAN to the Internet quickly, reliably, and securely. The Nortel Business Communications Manager also offers an extensive range of communications applications—call center, unified messaging, VPN, auto attendant, wireless telephony—all accessed by entering a key code.

The top differentiators of the BCM200 and BMC400 platforms include:

- comprehensive solutions that are easily implemented
- choice of either IP-enabled or pure IP solutions
- investment protection, because businesses can migrate without investing in new infrastructures
- delivery of value-added applications, such as

multimedia call center, IP telephony, voice and data networking, virtual private networks (VPNs), unified messaging, and mobility

- redundancy options, including power, fans, and hard-drive that automatically detect failures and switch over seamlessly with no loss of service

Nortel BCM200

- 2 rack-unit high chassis to support up to 2 media bay modules
- 64 digital telephone users maximum
- 90 IP telephone users maximum

Nortel BCM400

- 4 rack-unit high chassis to support up to 4 media bay modules
- optional expansion cabinet to add up to 6 additional media bay modules
- 192 digital telephone users maximum (with expansion gateway)
- 90 IP telephone users maximum
- optional redundant hard drive and RAID controller
- optional redundant power supplies and fans (main and expansion cabinet)

Market Information

- Unlike other integrated solutions, the Nortel BCM offers full redundancy and PSTN fallback.
- The Nortel BCM delivers the widest range of enterprise-strength applications in a single, integrated solution.
- Value-added services can be implemented with a key code rather than adding hardware.
- No competitor offers as many telephony features.
- Out of the box, BCM offers unparalleled ease of configuration and management.
- Even if the IP network or WAN stops operating, users still maintain quality call processing and solid reliability.
- The Nortel BCM delivers convergence capabilities previously available only to large enterprises.

Technical Specifications

Platform	BCM 200	BCM400
Telephone Sets Supported		
IP Phones		
IP Conference Phone 2033	x	x
IP Phone 2001, 2002, 2004 and 2007	x	x
IP Phone 1120E and 1140E	x	x
IP Softphone 2050	x	x
Mobile Voice Client 2050	x	x
Digital Desktop Telephones		
T7100, T7208, T7310, T7316 and T7316e	x	x
T24 Key Indicator Module	x	x
Digital Doorphone and Opening Controller	x	x
WLAN Handsets		
2210 and 2211	x	x
Digital Mobility Sets Supported		
7240, C4010, C4010Ex, C4020, and C4050	x	x
T7406 900 MHz Cordless Telephone	x	x
Digital Mobility Rugged Handsets		
7430 and 7440	x	x
Environmental		
Dimensions	Width: 46.5 cm (18.3 in) Depth: 44.5 cm (17.5 in.) Height: 8.9 cm (3.5 in)	
Power	Standard Power Supply – Autosensing; 300 Watts; 90–264 V ac; 6.0A–3.0A, 60–50 Hz Redundant Power Supply – BCM400 only Autosensing; 350 Watts; 90–264 V ac; 7.0A–3.5A, 60–50 Hz	
Supported Trunk Types		
Loop, E and M, DID, Ground Start T1 trunks	x	
Class/CMS services	x	
UK DASS2 and DPNSS	x	
Euro, France, Italy, and Switzerland ISDN	x	
MCDN networking (over PRI and IP)	x	
PRI-DMS100/SL100	x	
Q.sig networking using PRI	x	

Platform	BCM 200	BCM400
Voice Applications		
Basic Software Features	Over 400 telephony features	
Features		
Maximum Active Agents	80	80
Maximum Skill sets	2	2
Maximum Number of Lines (trunks)	15	15
Recorded Announcements	30	30
Routing steps in routing table	20	20
Intelligent Overflow - Change Priorities	x	x
Call routing step to custom autoattendant greeting	x	x
Real time status display	x	x
Reporting for Call Center	x	x
Expected Wait Time	x	x
Supervisor Help and Silent Monitor	x	x
Caller ID on agent sets	x	x
Agent's set forwarded to agent's mailbox	x	x
Professional Call Center - includes Call Center basic features plus the following:		
Maximum Active Agents	80	80
Maximum Skillsets	50	50
Maximum Number of Lines (trunks)	100	100
Maximum Recorded Announcements	150	150
Dynamic Agent Prioritization per Skillset	x	x
Call Routing Enhancements	x	x
Overflow Enhancements	x	x
Reporting for Call Center (RCC)	x	x
Multimedia Call Center (click for agent voice or chat, Web page push, Follow-me browsing, TAPI 2.1 CTI, IVR toolkit)	x	x
Autoattendant, CCR Trees		
Autoattendant	x	x
Centralized Autoattendant		
BCM-to-BCM	x	x
BCM-to-Norstar	x	x
CS1000-to-BCM	x	x
Park and Page from mailbox	x	x

Platform	BCM 200	BCM400
Messaging		
Fully featured voice messaging with up to 1000 mailboxes	x	x
Unified Messaging support for: Outlook, Outlook Express, Lotus Notes, Qualcomm Eudora Pro, Novell Groupwise, and Netscape Messenger	x	x
Centralized Voice Messaging – BCM-to-BCM, BCM-to-Norstar, CS1000-to-BCM	x	x
Fax Services		
T.38 FAX over IP	x	x
Fax Messaging, Fax Overflow and Fax-on-Demand	x	x
Voice Networking		
H.323 Gateway, H.323 v4 support	x	x
SIP trunking (BCM to BCM)	x	x
Communication Server 1000 H.323	x	x
Meridian IP Trunk 3.01 H.323	x	x
CS2000 H.323 (SN07 and SN08)	x	x
MCS5100 H.323	x	x
Gatekeeper interworking	x	x
Radvision ECS 2.01 and ECS 3.2	x	x
NetCentrex	x	x
CS1000 Signaling Server (Rls 3.0) and CS1000 NRS (Rls 4.0)	x	x
CS2000	x	x
H.245 Tunneling and MCDN over H.323	x	x
WAN Interfaces		
Ethernet WAN Interface	x	x
Integrated ADSL Modem	x	x
V.35, Dual v.35, X.21, V.90	x	x
T1 with built in CSU/DSU	x	x
ISDN dial-on-demand	x	x
LAN Interfaces		
Ethernet LAN Interfaces	1 or 2	1 or 2
10/100 Autonegotiating	x	x
Autosensing	x	x
Protocols		
IP	x	x

Platform	BCM 200	BCM400
IPX	x	x
Frame Relay	x	x
Point-to-Point Protocol (PPP)	x	x
Multilink PPP (MLPPP)	x	x
Point-to-Point Protocol Over Ethernet (PPPoE)	x	x
PPP Fragmentation	x	x
RTP Header Compression	x	x
DLCI-to-IP Mapping for Frame Relay	x	x
Routing		
Open Shortest Path First (OSPF)	x	x
Static, RIP and RIP v2	x	x
Security and Firewalls		
Network Address Translation (NAT)	x	x
Stateful packet filtering	x	x
PPTP (point-to-point tunneling protocol)	x	x
IPSec Branch Office tunnel support	x	x
IPSec Client Termination	x	x
VoIP signaling and media transparency (H.323, SIP, Unistim ALGs)	x	x
SSL - Secure Socket Layer support	x	x
SSH - Secure Shell Support	x	x
Secure dial back	x	x
PAP/CHAP	x	x
Two-way authentication	x	x
QoS		
DiffServ marking for VoIP media and signaling	x	x
DiffServ Queuing on WAN/LAN interfaces	x	x
PVQM for Nortel IP telephones	x	x
IP Services		
Directory Name Service (DNS) proxy	x	x
DHCP Server	x	x
DHCP Relay Agent	x	x
Web Caching	x	x
Multiple IP Addresses per interface	x	x
Direct Mode for Multiple IP Addresses	x	x

Platform	BCM 200	BCM400
Netlink Manager	x	x
VPN Management		
IPSec tunnels and VPN	x	x
VoIP transport through IPSec tunnels (branch-to-branch)	x	x
Nortel VPN client support	x	x
IPSec encryption, authentication, protocol, and NAT Traversal	x	x
Firewall Content Filtering	x	x
Firewall Management	x	x
System Management		
Unified Manager system management interface	x	x
SNMP Traps	x	x
Network configuration manager for multi-site management and configuration of up to 2000 Nortel BCM200 and 400 nodes	x	x
Mobility Software Service Tool (when equipped with DMC)	x	x

Ordering Information

For further information, contact your local Nortel representative.

Nortel Small and Medium Business (SMB) Data Portfolio

The Nortel Small and Medium Business (SMB) Data portfolio products provide employees the freedom to be productive throughout the workplace. Flexible wireless LAN solutions provide access to many of the same voice, data, and multimedia applications available on a traditional LAN over a wireless network. Digital mobility solutions for the BCM and Norstar help to ensure fast, easy access to people and data—regardless of worker location—through the use of cordless handsets.

From networks to applications, the Nortel award-winning communications solutions meet the unique requirements, challenges, and budgets of small businesses. Whether your customers need data networks, telephony, converged voice and data networks, mobility, or security solutions, the Nortel SMB Data products deliver the services needed.

The SMB Data portfolio comprises the following products:

- Business Element Manager
- Business Ethernet Switches
 - BES110-24T
 - BES110-48T
 - BES120-24T PWR
 - BES120-48T PWR
- Business Access Point 120 (BAP120)
- Business Secure Router 200 series
 - BSR222

Nortel Business Element Manager

Overview

The Nortel SMB product portfolio offers a unique management experience through the Nortel Business Element Manager (BEM), which enables the management of all Nortel SMB products within a single platform. Support within the BEM for all SMB products (Business Ethernet Switch, Business Access Point, Business Secure Router, and Business Communications Manager) allows the network manager to configure and manage the network. This intuitive, task-oriented interface simplifies network management.

Ideal For

Nortel Business Element Manager is ideal for small and medium businesses that want to:

- build a network to suit their needs
- manage an entire Nortel SMB network from a single management station within the network
- reduce network operating costs
- enable the management of all Nortel SMB products within a single platform

Business Challenges

- Do you want to simplify the management of your network?
- Do you want to reduce operating costs to manage your network?

- Do you want to increase employee productivity?

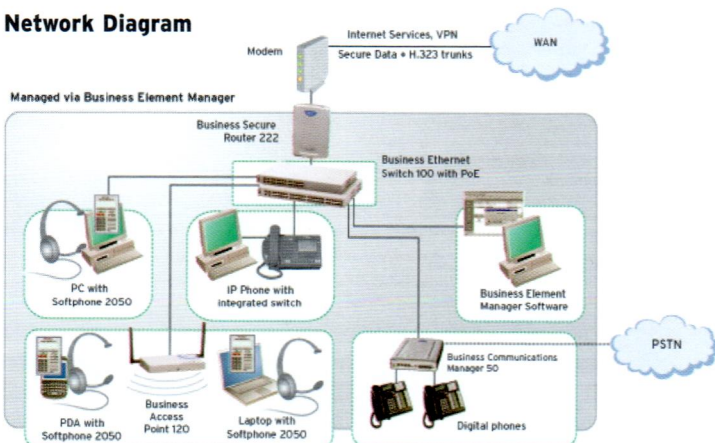
Typical Applications

- Medical clinics
- Offices
- Retail stores
- Schools
- Service centers
- Distribution centers

Key Points

The BEM Quick-Start navigation panel provides easy installation and configuration procedures for the nontechnically savvy SMB users.

Network Diagram



Features and Benefits

- intuitive management tool integrated with the BAP120, BES100, and BSR222
- quick-start tools for fast setup and user-friendly network management options
- solution-oriented management console and Web user interface
- simple and consistent intuitive interface across the SMB portfolio to streamline repetitive tasks

Ordering Information

For further information, contact your local Nortel representative.

Nortel Business Ethernet Switch 100 Series



Overview

The Nortel Business Ethernet Switch (BES) 100 series provides the building blocks to create a data information infrastructure that supports the business requirements of small to medium businesses. Through a purpose-built hardware design and software featureset, the Business Ethernet Switch 100 series allows users of all technical levels to quickly and easily integrate these products into new or existing IT infrastructures.

The Nortel Business Ethernet Switch (BES) 100 series comprises four products:

- BES 110-24T
- BES 110-48T
- BES 120-24T PWR
- BES 120-48T PWR

Ideal For

- Small to medium businesses that need a simple network infrastructure that offers support for wireless and IP communications technologies such as voice over wireless/IP, Unified Messaging, collaboration, video, Customer Relationship Management (CRM), and mobility.
- Small to medium businesses that need to reduce upgrade costs by implementing standards-based network solutions that easily migrate to next-generation technologies.
- Small to medium businesses that want to cost-effectively deliver communications to remote offices and mobile workers by integrating their voice and data networks.

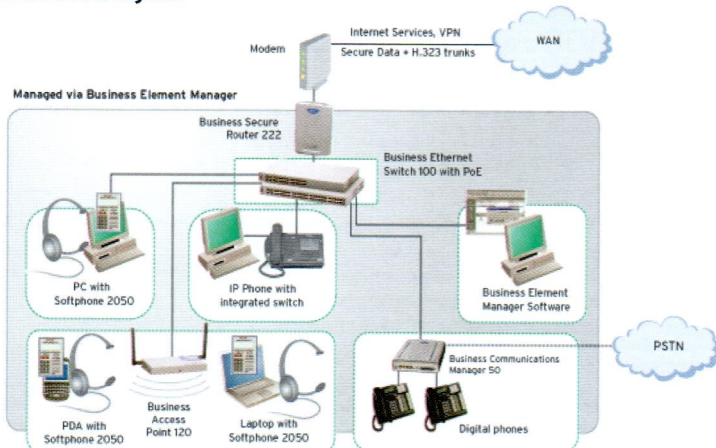
Business Challenges

- Are price and performance predominant decision factors?
- Do you want to improve employees accessibility and improve customer service by using new, flexible communications applications?
- Do you want to increase productivity, enhance collaboration, and improve communications with secure network access for you remote and mobile workers?

Typical Applications

- Medical clinics
- Offices
- Retail stores
- Schools
- Service centers
- Distribution centers

Network Diagram



Key Points

- Simplifies VoIP deployment with Business Communications Manager (BCM).
- Supports integrated management with BCM.
- Delivers advanced level features that enable business growth and profitability.
- Provides flexibility and scalability with stacking support.
- Lowers the cost of ownership.
- Provides built-in MAC address-based port security.

Features and Benefits

- **Simplified installation:** Through support for the autonegotiation of speed and duplex mode and support for Auto-MDI/MDIX, easy-to-read LEDs, as well as support for a default IP address or BootP for automatic IP address allocation across the network, installing and gaining initial connectivity to desktop PCs, printers, and other networked devices is easy.
- **Solutions-based management:** The Nortel SMB product portfolio offers a unique management experience through the Nortel Business Element Manager to manage all Nortel SMB products within a single platform. Support within the Business Element Manager for the Business Ethernet Switch 100 allows the network manager to configure

and manage the switch.

- **Support for Power over Ethernet (PoE):** The Business Ethernet Switch 100 series is equipped with support for PoE. The products in this series can provide power to devices such as Voice over IP handsets or wireless access points, and depending on the number of attached devices, can supply 15.4 W of power for each port.
- **Convergence-ready functionality:** Prioritization of the data on the network is essential to help that mission-critical applications such as voice are delivered in a timely manner and treated differently to non-time-sensitive data. To ensure that data is properly classified into four different hardware queues, the Business Ethernet Switch 100 series products place traffic into different priority queues by reading a packet 802.1p or DSCP prioritization value. Servicing each of the priority queues can be performed by using either the Weighted Round Robin or Strict Priority queuing methods.
- **Complete SMB Solution:** Nortel provides an end-to-end solution for the small to medium business to build networks that fit customer needs. The Business Ethernet Switch 120-24T-PWR can be used with the Business

Secure Router 222 for access to the Internet, the Business Access Point 120 for wireless connectivity, the Business Communication Manager 50 for voice integration, and the Business Element Manager, which can manage your entire Nortel SMB network from a single management station within the network.

Market Information

Nortel is a trusted leader in communications technology with more than 15 million Norstar and 30 000 BCM systems installed in small and medium business and branch offices in more than 80 countries. Nortel designed its BES 100 series specifically for the needs of small and medium business.

Technical Specifications

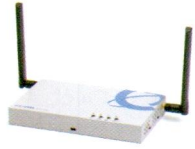
	BES 110-24T	BES 110-48T	BES 120-24T PWR	BES 120-48T PWR
Physical Specifications	Height: 4.4 cm (1.73 in.)			
	Width: 44.1 cm (17.36 in.)			
	Depth: 30.9 cm (12.17 in.)	Depth: 14.53 cm (36.9 in.)	Depth: 30.9 cm (12.17 in.)	Depth: 36.9 cm (14.53 in.)
	Weight: 3.86 kg (8.5 lb)	Weight: 4.76 kg (10.5 lb)	Weight: 4.26 kg (9.4 lb)	Weight: 5.26 kg (11.6 lb)
Calculated MTBF @ 25°C (77°F)	207 314 hours 150 730 hours 144 883 hours 114 208 hours			
Network protocol and standards compatibility	IEEE 802.3 10 Base-T (ISO/IEC 8802-3, Clause 14) IEEE 802.3u 100 Base-TX (ISO/IEC 8802-3, Clause 25) IEEE 802.3u Autonegotiation on Twisted Pair (ISO/IEC 8802-3, Clause 28) IEEE 802.3x (Flow Control on the Gigabit Uplink ports) IEEE 802.3z (Gigabit) IEEE 802.1d MAC Bridges (ISO/IEC 10038) IEEE 802.1p (Prioritizing) IEEE 802.1Q (VLAN Tagging) IEEE 802.1D (Spanning Tree Protocol) IEEE 802.3ad LACP IEEE 802.1w (Rapid Spanning Tree Protocol) IEEE 802.3af (Power over Ethernet) IEEE 802.1AB (Link Layer Discovery)			
Electrical specifications	Input voltage (ac version): 100–240 V ac @ 50–60 Hz Input power consumption (ac version): non-PoE: 45 W maximum PoE: 250 W maximum Input current (ac version): Non-PoE: 0.8 A @ 100 V ac, 0.4 A @ 240 V ac PoE: 2.9 A @ 100 V ac, 1.1 A @ 240 V ac Maximum thermal output: Non-PoE: 154 BTU/hour PoE: 853 BTU/hour			
Environmental specifications	Operating temperature: 0° to 40°C (32° to 104°F) Storage temperature: –40° to 70°C (–40° to 158°F) Operating humidity: 10 to 95% maximum relative humidity, noncondensing Storage humidity: 5 to 95% maximum relative humidity, noncondensing All Business Ethernet Switch 100 products are RoHS compliant to the 5/6 compliance standard			
Safety Agency Approvals	IEC 60950, CB report and certificate with all national deviations UL 60950 CSA 22.2 No. 60950950 EN 60950 UL-94-V1 flammability requirements for PC board NOM-019			

	BES 110-24T	BES 110-48T	BES 120-24T PWR	BES 120-48T PWR
RFC support	RFC 1493 (Bridge MIB); RFC 2863 (Interfaces Group MIB); RFC 2665 (Ethernet MIB); RFC 2737 (Entity MIBv2); RFC 2819 (RMON MIB); RFC 1271 (RMON); RFC 1157 (SNMP); RFC 3412 (SNMP Message Processing); RFC 791 (IP); RFC 792 (ICMP); RFC 793 (TCP); RFC 783 (TFTP); RFC 826 (ARP); RFC 768 (UDP); RFC 951 (BootP); RFC 2236 (IGMPv2); RFC 1112 (IGMPv1); RFC 1945 (HTTP v1.0); RFC 894 (IP over Ethernet); RFC 2674 (Q MIB); RFC 2578 (LDAPv2); RFC 3621 (PoE MIB); RFC 2579 (SMIPv2); RFC 3411 (SNMP Frameworks); RFC 2011 (MIB-II); RFC 2021 (RMON MIBBase v2 using SMIPv2); RFC 3413 (SNMP Applications); RFC 3415 (VACM for SNMP); RFC 3418 (MIB for SNMP); RFC 2933 (IGMP MIB); RFC 3584 (Co-existence of SNMP v1, v2, and v3); RFC 3291 (Textual Conventions for Internet Network Addresses); RFC 2213 (Integrated Messaging Services MIB); RFC 3289 (Differentiated Services MIB)			
EMC Agency Approvals	CISPR 22, Class A CISPR 24, Class A U.S.: CFR47, Part 15, Subpart B, Class A Canada: ICES-003, Issue 3, Class A Australia/New Zealand: AS/NZS 3548, Class A Japan: VCCI, class A Taiwan: CNS 13438, Class A Europe: EN55022, Class A and EN55024 EN61000-3-2, EN61000-3-3 EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11			
Management	Easy-to-use Web interface for administration			

Ordering Information

For further information, contact your local Nortel representative.

Nortel Business Access Point 120



Overview

The Nortel Business Nortel Business Access Point (BAP) 120 meets the needs of SMBs. The BAP120 is ideal for offices, medical clinics, retail stores, schools, and service and distribution centers, or anywhere a business needs to extend secure, reliable wireless service to employees. As part of the SMB solution, the BAP120 enables workers to roam throughout the office while their voice and data communications services follow them.

Ideal For

- Small to medium businesses (SMB) that want to offer new levels of freedom and flexibility without requiring additional staff to manage the company network.
- Small to medium businesses that want wireless local area network (WLAN) access based on global industry standards throughout their offices or facilities.
- Small to medium businesses that cannot afford an Ethernet connection to every access point.
- Small to medium businesses that want secure access for only authorized users.

Business Challenges

- Would you like to extend wireless access to communal workspaces and gathering areas?
- Would you like to offer wireless Internet access in your customer lounge or dining area as a perk for customers?
- Could your staff be more productive if they

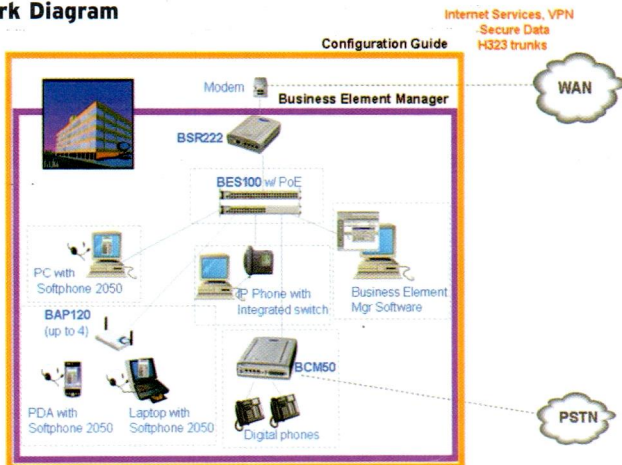
stayed in touch even when they are on the manufacturing floor, helping retail customers, visiting patients, or meeting with colleagues?

- Can computer-aided tasks, such as taking inventory, updating patient records, or tracking incoming shipments, be streamlined by using wireless scanners or tablet PCs that can accept data entry on the spot, anywhere?
- Do you need to connect people whose jobs are not tied to any one location, such as service technicians or outside salespeople?
- Do you need to extend a cost-effective, secure, reliable wireless service to your employees?

Typical Applications

- Medical clinics
- Offices
- Retail stores
- Schools
- Service centers
- Distribution centers

Network Diagram



Key Points

The Business Access Point 120 supports:

- the WLAN industry standards defined by the Institute of Electrical and Electronics Engineers (IEEE)
- the Wi-Fi Multimedia (WMM) industry standard to give voice service the priority treatment it requires
- wireless local area network (WLAN) access from IP devices (PDAs or PCs) equipped with wireless NIC interwork interface cards
- connectivity to a LAN switch (such as the Nortel Business Ethernet Switch) using a 10 or 100 Mb/s Ethernet connection

Features and Benefits

- **Network access throughout the building:** call forwarding, conference calling, voice mail, personalized greetings, Unified Messaging, Automated Attendant features, and more can work the same on the voice-ready wireless device as on the desktop phone.
- **Excellent coverage:** the Business Access Point 120 can be associated with up to 128 clients (users), or 64 clients if security features are added to the accounts. With or without security, the system can support up to 64 active users at a time. Because the WLAN uses a radio frequency different from cell phones no cross-talk or interference occurs between the two.
- **Support for Wireless Distribution System (WDS):** the Business Access Point 120 supports the WDS industry standard, which enables access points to communicate with each other to transmit wireless traffic. In a Wireless Distribution System, only one access point needs to be connected directly to the Ethernet core switch. In this arrangement, Business Access Point 120 units adopt one of two roles:
 - In Wireless Repeater Mode, an access point can serve mobile users and communicate with another access point.
 - In Wireless Bridging Mode, the access point only transmits traffic only between access points; it does not serve mobile users. One such access point serves as

the root bridge with wired access to the Ethernet switch and from there to the rest of the wired company network.

- **Secure access for authorized users only:** the Business Access Point 120 includes security provisions that protect a company network and the network users. For example:
 - Authentication procedures help to ensure that users are who they say they are and prevent unauthorized users or devices from gaining access to the network.
 - Encryption protects the confidentiality of traffic in the air, so even if a hacker intercepts a wireless transmission, the content is unreadable.
 - Virtual LANs make certain that one physical network can segregate traffic into as many as eight logical partitions.
- **Wi-Fi hotspot for customers:** the virtual LAN (VLAN) capability enables a company to set up a wireless hotspot for customers to use when they visit company locations. While customers are in the dining area, customer lounge, or guest rooms, customers can browse the Web and use e-mail from their wireless-enabled IP devices.
- **Fast and easy implementation:** the Business Access Point 120 contains its own service intelligence to eliminate the need to install a separate controller or security components.
- **Streamlined management:** Nortel designed its Business Access Point 120 to be simple for the casual computer user to manage. The BAP120 uses the same Nortel Business Element Manager interface that is used to manage the Nortel Business Communications Manager 50, Nortel Business Ethernet Switch 100 series, and Nortel Business Secure Router 222. The intuitive, graphical Web interface is consistent across these products, which makes administrative tasks easy to use.

Market Information

Nortel is a trusted leader in wireless communications technology for small and medium businesses. The BAP120 and other SMB products bring an affordable solution to small and medium businesses.

Technical Specifications

	BAP 120
Physical Specification	Height: 2.5 cm (.98 in.) Width: 21 cm (8.26 in.) Depth: 12.5 cm (4.92 in.) Weight: 0.80 kg (1.76 lb)
System features and capabilities	IEEE 802.11a UNI 1 band (5150 – 5250 GHz) IEEE 802.11a UNI 2 band (5250 – 5350 GHz) IEEE 802.11a UNI 4 band (5470 – 5735 GHz) IEEE 802.11e ECDA/WME Seamless roaming (IAPP) Auto-RF Channel Selection Data, multimedia, and voice over in-building WLAN Initial voice support – PDAs/PCs with Nortel IP Softphone 2050 or Mobile Voice Client 2050 Support for Power over Ethernet – IEEE 802.3af Uplink – Autosensing IEEE 802.3 10/100 BaseT Ethernet RJ-45, CSMS/CD, Class 2 AF Support for eight (8) Service Set Identifiers (SSIDs) Mapping of up to eight (8) SSIDs to VLANs VLAN trunking WDS (Wireless Distribution System) –bridge mode and repeater mode
Configuration and security	Graphical user interface for access point configuration Encryption WEP – 64, 128, 152 bits (RC4) WPA – 128 bit (TKIP, AES) WPA2, IEEE 802.11i – 128 bit (TKIP, AES) Authentication IEEE 802.1x EAP: MD5, TLS, TTLS, PEAP WPA/WPA2 – PSK Access control list Blocking SSID broadcast VPN pass-through IPSec, SSL, PPTP, L2TP
Radio and antenna	2dBi/4.5dBi dual band omni-directional antennas External antenna connector Options: 6dBi/8dBi directional dual-band antennas
Certification and regulatory approvals	Wi-Fi Alliance Certifications: IEEE 802.11a, IEEE 802.11b, IEEE 802.11g, WEP, WPA (Enterprise), WPA2 (Enterprise), EAP-TLS, EAP-TTLS, EAP-PEAP, WMM Regulatory approvals Radio: FCC, Industry Canada, CE mark Safety: CSA / UL, CE mark, C-tick Global regulatory
Environmental specifications	Operating temperature: 0° to 50°C indoor (32°F to 122°F) Storage temperature: –50° to 70°C (–58° to 158°F) Humidity: 0.35 percent, noncondensing
Mean Time Between Failures	117 034 hours (13 years)
Shipping	10 975 m (36 000 ft) @ –40°C (–40°F) IEC 68-2-40 test Z/AM, IEC 68-2-41 test Z/AMDPower requirements
Power over Ethernet nominal input voltage	48 V dc; dc power adapter: 5 V, 3 A power adapter
Power consumption	Maximum consumption: 8.16 W Typical both 802.11a and 802.11b/g radios: 6.63 W

Ordering Information

For further information, contact your local Nortel representative.

Nortel Business Secure Router 200 Series



Overview

The Nortel Business Secure Router 200 (BSR200) series is for small to medium businesses (SMB). The BSR200 series is converged broadband access routers that provide a secure connection to the Internet over a digital broadband connection such as a Digital Subscriber Line (DSL) or cable mode as well as other broadband technologies. The Business Secure Router 222 is the first router introduced in the BSR200 series.

Nortel Business Secure Router 222

The Nortel Business Secure Router 222 (BSR222) delivers secure broadband routing and data services. Nortel designed the BSR222 for small and medium business with a focus on high-quality security. The BSR222 supports authentication services, including 802.1x, third-party EAP clients, firewall protection, and advanced security features that work with Secure Network Access (SNA). The BSR222 is compatible with Nortel call servers and IP phones, including the Softphone 2050.

Ideal For

- Small to medium businesses that want to offer new levels of freedom and flexibility for their employees.
- Small to medium businesses that want secure access for only authorized users.
- Small to medium businesses with sites with 1 to 50 end users.
- Small to medium businesses that want to connect their internal networks to other business locations and have high-speed and always-on access to the Internet.

Business Challenges

- Can your employees be more productive if they had secure access to the company network when they work from home or on the road?
- Do your employees often work after hours or require flexible working hours?
- Do your employees need to share applications and files with users in other locations?
- Do your employees need to send and receive e-mail or conduct research or business on the Web?
- Can your business benefit by backing up computer records to an off-site disaster recovery facility?
- Do you consider security as part of your IT strategy?

- Do you restrict access to some business applications?
- Is your business set up to respond automatically to a security attack?
- Do you want to connect to the outside world without using dedicated, leased lines, analog lines, or a modem?

Typical Applications

- Medical clinics
- Offices
- Retail stores
- Schools
- Service centers
- Distribution centers

Key Points

- **Support a full range of voice and data services:** the Business Secure Router 222 supports all the voice and data features of your Nortel communication servers and IP phones. Hundreds of calling features, voice messaging, Unified Messaging, Automated Attendant, Contact Centers capabilities, and more can span multiple locations.
- **Create secure networks over the public Internet:** virtual private networks (VPNs) enable you to use the Internet as your own private network. You can establish secure connections with home-based workers, business partners, and satellite locations far beyond the reach of the internal company network.

- **Protect the confidentiality of data in transit:** traffic is encrypted to prevent eavesdropping. Even if data traffic can be seen, it is unreadable by anyone except the intended recipient, whose device has the sole key to decipher the message at the other end.
- **Prevent hackers and viruses from entering your network:** a built-in firewall provides a perimeter defense to guard your business network against unauthorized users, such as those trying to "spoof" or pretend to be legitimate users.
- **Prioritize your most important services:** some data services, such as VoIP, are sensitive to even the slightest delay, while others, such as e-mail or fax services, can receive secondary treatment if necessary.
- **Increase security and flexibility in IP Addressing:** Network Address Translation (NAT) converts internal IP addresses into your public IP address and vice versa. By hiding your private IP addresses from the world, NAT provides an extra layer of security. NAT can also be used to share static addresses across a group of users who need exclusive, but temporary, use of a static IP address. Because static IP addresses can be costly, this can translate into hard cash savings for your company.
- **Connect to the Internet and intranet through one link:** a single physical interface can support multiple IP addresses for internal and external communications, each with its own filters and policies.
- **Integrated security features** mean that the routers in the Nortel Business Secure Router portfolio support IPSec VPN services for secure voice and data communications, stateful packet inspection firewalls, H.323 standard, SIP, and ALGs for VoIP.
- **Integrated solution** means that the routers in the Nortel Business Secure Router portfolio have a wide array of integrated capabilities, including IPSec, VPN, stateful firewall, built-in Ethernet ports, and a built-in ADSL2 and ADSL2+ interface. This integrated support eliminates the need to purchase extra equipment to support additional services.
- **Simplified user architecture** means that Nortel offers command line interface scripting tools to deploy the routers quickly and to make maintenance easy.
- **Scalable design** means businesses can add more Nortel Business Secure Routers as needs change.

Market Information

Nortel is a trusted leader in wireless communications technology for small and medium businesses. The BSR222 and other SMB products bring an affordable solution to small and medium businesses.

Features and Benefits

The Nortel Business Secure Router 222 enables secure, cost-effective, end-to-end converged solutions for business.

- **High performance** means that the routers in the Nortel Business Secure Router portfolio perform at wire speed even with small packet sizes and network services enabled.
- **Advanced technology** makes the routers in the Nortel Business Secure Router portfolio industry leaders.
- **Vigorous routing features** make the routers in the Nortel Business Secure Router portfolio industry leaders.

Technical Specifications

	BSR 222
Physical specifications	Height: 5.5 cm (2.2 in.) Width: 14.5 cm (5.7 in.) Depth: 19.5 cm (7.7 in.) Weight: 0.4 kg (0.9 lb)
Input/Output requirements	WAN one-port 10/100 BaseT autosensing, RJ-45 connector Four-port Ethernet 10/100 BaseT autosensing switch; RG-45 (fifth port for internal connection)
Virtual private network (VPN) services	Minimum ten IPsec tunnels IKEv1 Main Mode IKEv1 Aggressive Mode 1 to 3 IP pools for Client 16 split networks configured 64 subnets specified for split (inverse) network Diffie-Hellman Group 1 and 2 IPsec tunnel mode ESP Support for dynamically addressed peers (ABOT) NAT traversal IPsec transport mode Keep alive for branch office and client tunnels Nortel VPN Router Client termination
Encryption services	DES (Data Encryption Standard) 3DES Data Authentication SHA-1 Data Authentication MD-5 Advanced Encryption Standard (AES)-128 AES-192 and AES-256 for Branch-office tunnels
Authentication services	Preshared secrets External RADIUS support 802.1x/EAP support
Firewall protection	Stateful packet inspection IP Application Inspection (FTP, SMTP, HTTP, Telnet, SSL, DNS, and more) denial of service (DoS) detection and prevention URL filtering Content filtering
ALG	CU-SeeME FTP SIP H.323 IPsec VDI Live RealAudio

IP services: NAT	Network Address Translation (NAT): Many-to-one, static, many-to-many, many one-to-one port forwarding IPSec pass-through multiple simultaneous VPN connections; SIP and H.323 ALGs; port-restricted cone NAT; NAT support for tunnel-mode IPSec tunnels IP routing: Clear text routing, static routing, RIP v1 and v2, IGMP Dynamic Host Control Protocol (DHCP): Client, server, relay, static mapping (eight IP address lease mapping) Domain name service (DNS): DNS proxy, dynamic DNS NTP: RFC-867,868,1305 Quality of Service: Class-based queuing and bandwidth allocation
Layer 2 protocols	Point-to-point protocol over Ethernet (PPPoE), IP masquerade/alias – configurable MAC address
Management	TFTP/FTP firmware upload, serial console port, built-in diagnostic tool, SNMP, Web interface, command-line interface (ZyXEL command line interpreter), remote management through FTP, Telnet and Web, configuration backup and restore using FTP and Web
WAN and LAN ports	The WAN and LAN ports are 10/100 Base-T Ethernet ports without PoE
Two-port router	The router is based on the Intel IXP-425 network processor running at 266 MHz. It will have 64 MB of FLASH memory, and 32 MB of RAM
5-port switch	The 5-port Layer-2 switch uses the Infineon 6996i chip
Serial port	The serial port provides a DCE connection to either back up a WAN or to install software into a router with a corrupted software load.
Power supply	The router is powered by 19 V dc. The power supply circuit block converts this supply-to-supply voltages needed by the rest of the circuitry. The BSR 222 uses a universal wall-mounted power supply.
Environmental	Operating temperature: 0°C to 50° C (32° to 122° F) Humidity: Up to 90 percent (noncondensing) Altitude: Up to 3024 m (10 000 ft)

Ordering Information

For further information, contact your local Nortel representative.

Nortel Enterprise IP Telephony Portfolio

The Nortel Enterprise IP Telephony portfolio consists of the Nortel Communication Server (CS) 1000 portfolio, the Nortel Media Gateway 1000 portfolio, and the Nortel Survivable Remote Gateway (SRG) portfolio. The Enterprise IP Telephony portfolio offers almost endless solution possibilities. Customers can select the solution that best fits their needs based on branch office size, feature requirements, environment, and budget.

The Nortel Communication Server 1000 portfolio delivers the benefits of network convergence and collaborative communications for today's increasingly virtual enterprise environment by using full-featured, IP-distributed communications systems. From the call center to the home office, the Communication Server 1000 products provide a host of innovative features, applications, network configurations and management tools that can help transform businesses into virtual enterprises.

The Nortel Communication Server 1000 is a server-based, full-featured IP PBX that provides the benefits of a converged network and advanced applications consisting of over 450 excellent telephony features and SIP-based functionality to deliver a fully integrated multimedia solution.

The server uses Nortel Communication Server 1000 software (currently Release 4.5). IT administrators perform system administration tasks using Communication Server 1000 Telephony Manager 3.0 and the Communication Server 1000 Element Manager.

Nortel Communication Server 1000 helps organizations change the way they work by giving home, mobile, and team users secure advanced business communications services away from the office. Users get secure services from any high-speed Internet connection point. The enterprise achieves investment protection and low cost of ownership.

The Communication Server 1000 portfolio is built on the VxWorks operating system and incorporates reliable hardware elements that have mean time between failure (MTBF) rates of 30 to 60 years. The system supports multiple options for survivability, redundancy, and geographic distribution.

The Nortel Media Gateway 1000 portfolio and the Nortel Remote Media Gateway portfolio extend communication services so that enterprises can provide a low-cost stand-alone remote solution for the Communication Server 1000 and Communication Server 2100 product lines. The Communication Server 2100 solution provides a network management package with the Communication Server 2100 host that delivers added survivability in remote locations.

The Nortel Survivable Remote Gateway (SRG) portfolio extends communications services to teleworkers and branch offices, bringing the same application access to remote workers as those at the main site. The SRG provides business continuity and support for automatic VoIP to PSTN failover in the event of a WAN access or main office services outage.

The Nortel Enterprise IP Telephony portfolio includes:

- Nortel Communication Server 1000 portfolio

- Communication Server 1000 software (currently Release 4.5)
- Communication Server 1000S
- Communication Server 1000E
- Communication Server 1000M
- Communication Server 1000 Series System Management
- Communication Server 1000 Element Manager
- Nortel Media Gateway 1000 portfolio
 - Media Gateway 1000S
 - Media Gateway 1000E
 - Media Gateway 1000M
- Nortel Media Gateway portfolio
 - Nortel Media Gateway 1000B
- Nortel Survivable Remote Gateway portfolio
 - Survivable Remote Gateway 200 (BCM 200)
 - Survivable Remote Gateway 400 (BCM 400)
 - Survivable Remote Gateway 50 (BCM50)
- Nortel Remote Gateway 9100 series
 - Remote Gateway 9115
 - Remote Gateway 9150
- Nortel Application Gateway 1000
- Nortel Communication Server 1000 Telephony Manager 3.0

Nortel Communication Server 1000 Portfolio

Overview

The Nortel Communication Server 1000 portfolio is an enterprise IP Telephony solution that supports a flexible mix of phones, applications, and Public Switched Telephone Network (PSTN) gateways over a converged network. The supported telephones include IP phones, digital TDM phones, analog TDM phones, DECT cordless, and 802.11 wireless LAN phones, as well as software phones on PCs and Personal Digital Assistants (PDA). The Communication Server 1000 offers the business telephony features and services developed for the market-leading Nortel Meridian 1 PBX, as well as new innovative features for IP convergence. The Communication Server 1000 supports business applications for individual and team productivity, mobility, customer service, and management control. The Communication Server 1000 also provides advanced networking services to other Nortel and non-Nortel equipment. The Communication Server 1000 portfolio adheres to industry standards to protect customer investments and to keep ownership costs among the lowest in the industry.

Ideal For

- enterprises that have a mobile workforce (for example, sales and service engineers, consultants, executives, and casual or part-time home-based workers)
- enterprises that have networks at multiple locations
- enterprises that want to upgrade their Nortel Meridian 1 PBX systems to a Communication Server 1000 system to save money
- enterprises that want the latest available business telephony features and services
- enterprises that have many additions, moves and changes (MAC)
- enterprises with Greenfield (new) sites or fully depreciated PBXs
- enterprises that want to transform the way they work

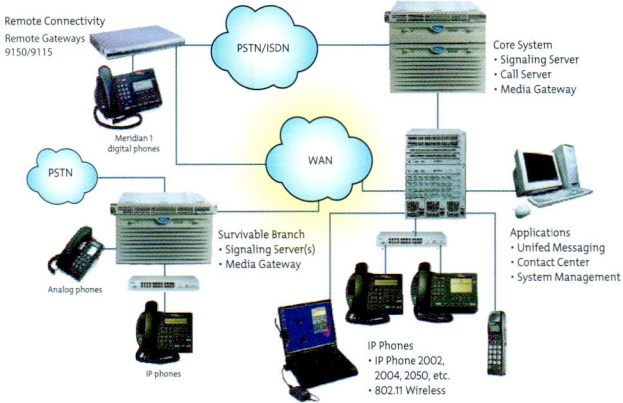
Business Challenges

- Does your business need to reduce its communications costs?
- Does your business want to enhance productivity and maintain productivity consistency at all its locations?
- Does your business need an improved plan for disaster recovery?
- Does your business want to increase its contact center revenue through geographic independence of contact center agents?
- Does your business plan to deploy IP Telephony?

Typical Applications

- homeworker solutions (for example, Remote Gateway 9115, IP SoftPhone 2050, and PC or Web access to business IP Telephony applications)
- mobile worker solutions (for example, Mobile Voice Client 2050, Web-browser access to business IP Telephony applications)
- team working solutions (for example, boss-secretary services, conference bridge with Outlook integration, and personal call assistant to link phone to Nortel MCS 5100 multimedia collaboration software)
- personal productivity solutions (for example, Nortel Integrated Call Director, Nortel Integrated Call Assistant, presence to check colleague availability to take a call, multimedia call handling, and instant messaging)
- switchboard operator services (for example, support for software applications, barge in, break in, and camp on to busy extension)
- network management control solutions (for example, integrated billing, unified directory services, global changes, "what if" analysis for forecasting, alarm management, reports, and easy configuration tools)

Network Diagram



Key Points

- distributed architecture over converged network
- software built on the proven reliable, feature-rich Meridian PBX feature set
- full application portfolio support using Nortel and Developer Partner Program compatible applications
- multiple built-in reliability mechanisms with no single point of failure, and robust operating systems
- scalable from 1000 to 15 000 IP clients for each call server (100 000 in a centrally managed network)
- multiple call servers networked with transparent
- IP networking to support tens of thousands of users
- centralized management control and a dial plan for 100 000 IP clients
- centralized and networked business communication services
- IP telephony service overlay that works on any data network based on open standards
- optional support for campus and geographic redundancy with Nortel Communication Server 1000E

Leadership & Innovation



Leading Edge Technology

Services Ubiquity



Anywhere, anytime, any device

Seamless Scalability



System grows as the business grows

Geographic Flexibility



Workforce Globalization without loss of capabilities

Business Continuity



Operation Resiliency

- Flexibility (Access)
- Dynamic Packet Core
- Standards based & Secure
- Multi-service Support

Network Transformation

- Mobility
- Personalization
- Engaged Services
- Multimedia Collaboration
- Flexibility (Service & Client)

Business Transformation

Nortel Communication Server 1000 software release 4.5

The Nortel Communication Server 1000 software release 4.5 is the latest software release for the Communication Server 1000 family of products and adds versatility and strength to the Communication Server 1000 products. This release tightens security and introduces Adaptive Network Bandwidth Management (ADBWM), which enhances the performance of Voice over IP (VoIP) networks based on real-time interaction. This release adds alternative routing functionality to Communication Server 1000 products.

The Communication Server 1000 software release introduces:

- alternate call routing for network bandwidth management
- adaptive network bandwidth management
- active call failover
- advanced UNlstim firmware downloads to support new IP phone types
- improved secure access
- Default Queue Management feature (Symposium specific)
- blocked call traffic report generation
- Element Manager navigation and usability improvements
- Element Manager encryption and security improvements
- ACD Agent capacity increased from 2200 to 3350
- Calling Line Identity (CLID) redirecting number enhancements
- campus redundancy enhancements
- IP call recording improvements
- enhanced system management features
- SNMP management improvements

Communication Server 1000S

The Nortel Communication Server 1000S is a fully distributed, IP Telephony solution with all the features and capabilities of a PBX. The primary design of the Communication Server 1000S supports Nortel IP phones, analog phones, and digital phones.

The Communication Server 1000S supports:

- scalability where each call server supports 1000 IP clients
- shared call servers
- shared media gateways
- redundant gatekeepers, gateways and client proxies
- WAN gateway survivability
- Media Gateway 1000S (a maximum of four for each system) to provide local access to TDM devices such as RAN and music, conference/tones, analog and digital lines.
- seamless network integration, simplified management, flexibility in deployment, and low support costs

Communication Server 1000E

The Nortel Communication Server 1000E is an IP PBX that brings Time Division Multiplex (TDM) PBX capabilities to a converged IP network. The Communication Server 1000E introduces a redundant call processor configuration. The Communication Server 1000E is for enterprises that want to install a full IP PBX architecture that supports many users. Enterprises can install the Communication Server 1000E at a single location or at many locations across a QoS-managed IP network. The Communication Server 1000E supports:

- Scalability where each call server supports 15 000 IP clients.
- Redundant call servers, gatekeepers, gateways, and client proxies.
- Campus mirroring, known as "split core," allows the physical separation of active and inactive call servers by as much as 40 kilometers (25 miles). A high-speed link connects the servers across a campus.
- Campus redundancy allows the customer to install the inactive call server from the active one using a dedicated fiber connection.

- Geographic redundancy allows the customer to install a redundant Communication Server 1000 system at a remote location over any distance. The enterprise WAN takes over call processing if the primary system fails or if the primary system is the subject of a disaster (for example, a fire or flood).
- Media Gateway 1000E (as many as 30 for each system) provides local access to TDM devices to support analog and digital lines and to support analog trunks.
- Media Gateway 1000T provides digital trunk PSTN access.

Communication Server 1000M

The Nortel Communication Server 1000M is for medium to large enterprises. The Communication Server 1000M provides advanced telephony features, redundant call processing, and the ability to serve both IP and TDM on a large scale. The Communication Server 1000M is available in the following configurations:

- Communication Server 1000M—Cabinet or Chassis (11C Cabinet or Chassis)
- Communication Server 1000M—Half-Group (51C)
- Communication Server 1000M—Single Group (61C)
- Communication Server 1000M—Multi-Group (81C)

The Communication Server 1000M supports:

- scalable on each call server to 15 000 IP clients and 16 000 digital or analog clients
- redundant, centralized call processor and gateways
- shared remote gateways
- integrated media gateways for trunk and line application interfaces
- investment protection
- seamless migration to IP Telephony
- geographic redundancy

Communication Server 1000 Series System Management

The Nortel Communication Server 1000 Telephony Manager 3.0 and Element Manager provide system management for Nortel Communication Server 1000 systems. The Element Manager is a centralized, user-friendly Web-based interface that supports:

- day-to-day management tasks
- configuration and maintenance of IP Peer and IP Telephony features
- configuration and maintenance of traditional routes and trunks
- configuration and maintenance of numbering plans
- configuration of Call Server data blocks
- maintenance commands, system status inquiries, backup and restore functions
- software and patch downloads
- software and patch activation
- station administration tools
- alarm management and troubleshooting

The Signaling Server hosts the Element Manager. Users access the Element Manager through a Web browser or through the Communication Server 1000 Telephony Manager 3.0. The Telephony Manager System Navigator includes integrated links to each network system and the respective instances of Element Manager.

Communication Server 1000 Element Manager

The Nortel Communication Server 1000 Element Manager is for use through a Web browser. The design simplifies management and configuration tasks IT administrators perform. The Element Manager provides:

- Web pages for a single point-of-access
- hide or show information feature capability
- full-text descriptions of parameters and online acronym help
- default configuration dialog boxes

Nortel Media Gateway 1000 Portfolio



Overview

Shared throughout the IP network, the Nortel Media Gateway 1000 portfolio products act as a bridge between IP and traditional telephony networks (such as the PSTN) and houses various cards that perform line, trunk, and translation functions. The hardware for the entire Media Gateway 1000 portfolio has the same characteristics: media cards, analog and digital line cards, analog and digital trunk cards, and applications use four card slots.

Nortel Media Gateway 1000S

The Communication Server 1000S uses a Nortel Media Gateway 1000S to support PSTN trunks, analog and digital telephone resources, TDM application cards, and Voice Gateway media Communication Server 1000S cards. Each Media Gateway supports one Media Gateway Expander. The Media Gateway 1000S contains a gateway controller card (called SSC card) and four slots for flexible configurations of line, trunk, and application cards. The SSC card controls interface and application cards and acts as a call processor in the survivable mode. The Call Server database is synchronized automatically onto this controller. Application cards provide interfaces to applications such as CallPilot and Nortel Integrated Applications portfolio.

Nortel Media Gateway 1000E

The Communication Server 1000E uses a Nortel Media Gateway 1000E to provide basic telephony media services. These services include tone detection, tone generation, and conference to phones. The Media Gateway 1000E operates under the direct control of the call server. The Media Gateway 1000E supports an optional Media Gateway 1000E Expander. The Media Gateway 1000E contains a gateway controller card (called SSC card) and four slots for IPE cards and Voice Gateway Media Cards. The Media Gateway 1000E supports CallPilot and Nortel Integrated applications. Also provided are direct physical connections for digital and analog (500/2500-type) telephones and analog trunks for telephone and facsimile.

The Communication Servers 1000E/S use a Nortel Media Gateway 1000T to provide digital trunk and Primary Rate Interface (PRI) access to the PSTN and to other PBX systems. The Media Gateway 1000T contains a gateway controller card (known as an SSC card) and four slots for IPE cards. Also supported is an optional MG 1000T Expander. Unlike the MG 1000Es, the MG 1000T platform does not operate under the direct control of the Communication Server 1000E Core Call Servers. Instead, the MG 1000T provides the primary processing for the MG 1000T platform. The MG 1000T Core SSC card controls the circuit cards in the MG 1000T core and all cards in up to four MG 1000T expansions. The MG 1000T supports media cards, digital PSTN interface cards (E1, T1, ISDN), analog trunk cards, service cards, and digital enhanced cordless telecommunications (DECT) mobility cards.

Nortel Media Gateway 1000M

As part of the Communication Server 2100 product line, the MG 1000M delivers a resilient and cost-effective solution with centralized management and administration to this marketplace. The MG 1000M is specifically designed to meet the stringent market requirements of the Federal Government's Defense Systems Network.

Features and Benefits

- Mobility services to provide "office anywhere" functionality that provides secure, user access to the same set of business communication services from any high-speed Internet connection point as easily as if users were in the office.

- Instant office moves at zero cost (that being DHCP IP phones, secure login from any IP network-wide virtual office phone, and IP software phone on a PC or PDA).
- Scalable to meet growing enterprise needs with 1000 to 15 000 IP clients on each call server, multiple call servers networked with transparent IP networking and a single gatekeeper that supports as many as 100 000 IP clients.
- Built-in reliability based on the WindRiver VxWorks operating system and a proven feature set with multiple resiliency mechanisms such as survivable call servers, signaling server redundancy configurations, and survivable WAN gateways.
- Extensive desktop portfolio meets diverse end-user requirements (for example, support for IP phones, software phones, 802.11 wireless LAN phones, and digital and analog phones).
- Business-critical applications support that includes Nortel Contact Center, Nortel Messaging and integrated services such as conferencing, one-number-follow-me, call director, recorded announcement, network-wide attendant, and messaging. A personal call assistant networks with multimedia services provided by Nortel Multimedia Communication Server (MCS) 5100.
- Survivable branch office flexibility supports phone type and size (Nortel Remote Gateway series for digital sets, Nortel Enterprise Media Gateway 1000B for branch offices supporting 50 to 400 users, Nortel Survivable Remote Gateway for 5 to 90 IP phones) and supports compatibility-tested third-party PSTN gateways (see Select Product Program section in this Guide).
- New desktop capabilities to provide network-wide virtual offices to all employees. For example, log into an IP phone on the network and use it as a personal phone, access the corporate directory (access to network directory using Communication Server 1000 Telephony Manager 3.0, which is LDAP compatible with an organizational unified directory), and access a wide-range of data applications for IP phones using the Nortel Application Gateway 1000.

- Multivendor networking standards (for example., DPNSS, Qsig, H.323, SIP) enable enterprises to benefit from existing investment to new users (including centralized voice mail, unified messaging, and operator switchboard services) without duplicating these services across platforms.

Market Information

According to Dell'Oro Worldwide PBX Q4 2005 report, Nortel:

- Is #1 in total telephony lines shipped for more than three consecutive years.
- Has 15 percent of the market share of total PBX lines shipped.
- Is #1 in the number of analog and digital lines shipped.
- Is #2 in the number of PBX IP lines shipped (tied with Cisco with only 0.5 percent less of the market share).
- Is #1 WW Hybrid IP/TDM PBX line shipments Q42005 and 2005.
- Is #1 WW Hybrid IP/TDM PBX IP line shipments Q42005 and 2005.

According to Infonetics, Nortel market share for Q42005 and 2005:

- Is #1 for PBX/KTS/IP (TDM and IP) lines shipped.
- Is #1 for TDM PBX/KTS lines shipped for 2005.
- Is #1 for IP PBX lines shipped in 2005.

According to Synergy Research Group:

- Nortel is #worldwide for Enterprise Telephony ports shipped in 2005.

Nortel recognizes that businesses evolve at different paces; therefore, Nortel caters to different needs, whether a brand new organization (Greenfield) or an existing installed base. Implementation of IP Telephony can be migratory (hybrid digital and IP) or a pure IP PBX strategy. Nortel is the only vendor to offer the flexibility and choice to meet individual needs along with assurances of product reliability, investment protection, an understandable cost-effective migration path, market price, and proven reputation.

Meridian 1 customers have an excellent migration path to convergence. Customers can add IP Telephony capabilities to existing Nortel Meridian 1 systems, share applications, and support featured connections between systems, or customers can evolve Meridian 1 to a Nortel Communication Server 1000 while preserving significant existing investments in end-user training and equipment. This demonstrates a proven commitment to the Nortel philosophy of investment protection and an innovative spirit.

Nortel Communication Server 1000 capitalizes on the Nortel Meridian 1 PBX software feature set and expertise to support the full suite of telephony features that Nortel developed according to business demands and feedback over the past 20 years—a one billion dollar investment over time. This results in an IP

Telephony offering with robust feature and application support.

Nortel helps companies create a better experience for customers and employees alike by providing solutions that address unique business realities. Delivering the value of IP Telephony, powerful new IP-based applications, and advanced wireless technologies can improve customer service and increase internal efficiency, enabling your company to achieve a strategic edge over its competitors. Whether a business is creating a new IP-based voice and data network or integrating powerful IP solutions into its existing digital telephony environment, Nortel has the experience and complete range of solutions needed to help ensure success.

Technical Specifications

Platform	CS1000S	CS1000M	CS1000E
Call Server	Yes	Yes	Yes
Capacity	1 000 IP users	15 000 IP Users (MG) 2000 IP Users (SG) 1000 IP Users (HG)	15 000 IP Users
Port Capacity	1248	16 500	16 500
Operating System	VxWorks from WindRiver Systems Inc.		
CPU/Memory	M68040 Call Processor, 48 MB Flash, 32 MB DRAM	Redundant CP PIV Call Processor; Flash not required, 256 MB DRAM	
Software Features	Over 650 PBX Telephony features		
Call Control APIs	TAPI		
Geographic Redundancy	—	SG and MG only	Yes
Campus Redundancy (Split Core)	—	—	Yes
Mounting	19 inch-rack mountable call server, signaling server and Media Gateways	19 inch-rack mountable signaling server, and Media Gateways	19 inch-rack mountable call server, signaling server, and Media Gateways
Geographic Distribution	call servers and gateways	—	call servers and gateways
Busy Hour Call Completions	20 000 BHCC TDM Calls, 240 000 BHCC IP Calls	280 000 BHCC IP-based calls (MG)	240 000 BHCC IP-based calls

Platform	CS1000S	CS1000M	CS1000E
Maximum Number of IP Phones	1000	15 000 (MG) 2000 IP Users (SG) 1000 IP Users (HG)	15 000
Maximum Number of Digital Phones	480	16 000	3000
Maximum Number of Analog Phones	480	16 000	3000

Telephones

IP Telephones and Clients	2001, 2002, 2004, 2007, 2033, WLAN 2210 and 2211, IP Softphone 2050, MVC 2050, Nortel Multimedia PC Client, Nortel Multimedia Web Client
Digital Telephones	M3901, M3902, M3904, M2006, M2008, M2008HF, M2616, M2216ACD
IP Phone Power options	802.3af Power over LAN, Power over LAN Hub and local ac adapter
Attendant Services	Attendant PC Console and M2250 Attendant Console

Trunk Types Supported

	Virtual Trunks with IP Peer Networks Digital: DTI, ISDN-PRI, ISDN-BRI Analog: Loop and Ground Start CO, FX, WATS, 2 or 4 wire E&M, 4 wire DX, DID, TIE, RAN, Paging
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Applications Supported

IP Line 4.0	Nortel Media Card – 8 Port Nortel Media Card – 32 Port	—
IP Remote Services	Remote Gateway 9100 series, Media Gateway 1000B, and Survivable Remote Gateway portfolio	
Nortel Unified Messaging	Call Pilot 201i, 703t, 1002rp, and Nortel Hospitality Messaging Server 400	
Nortel Contact Center Express	Up to 300 agents with up to 175 actively logged on (subject to capacity)	
Contact Center -Manager	Configurable to 3000 agents with 175 actively logged on (subject to capacity)	Configurable up to 3,000 agents with 2200 actively logged on (subject to capacity) *Increases to 3000 actively logged on with CP PIV introduction (Release 4.5)
Multimedia Communication Server (MCS) 5100	Micro System and Enterprise System	
Nortel Integrated Applications	Integrated Conference Bridge Integrated Recorded Announcer Integrated Call Assistant Integrated Call Director Integrated Voice Services	

Wireless Applications	WLAN Handsets 2210, 2211, 2212 and DECT 4060 WLAN IP Telephony Manager 2245 WLAN Application Gateway 2246 WLAN Mobile Adapter 2202 Nortel Wireless Access Point 2300 WLAN Security Switch 2350, 2360, 2361., 2380 Nortel Wireless Mesh Networks Wireless Gateway 7250 Wireless Access Point 7720 Wireless Bridge 7230		
Network/System Management	Nortel Communication Server 1000 Telephony Manager 3.0 Element Manager		
Systems Capabilities			
Network Signaling Protocols	H.323v4, SIP, 802.1 p/q, DiffServ, 802.3af, 802.11 a/b/g, SNMP, DHCP, RTP, RTCP, VPIM, plus the following SIP RFCs: 2976, 3261, 3262, 3263, 3264, 3265, 3311, 3323, 3326 and 3515 with Nortel Multimedia Communication Server (MCS) 5100		
Redundant Options	Call servers (standard) Signaling Server (Gatekeepers, Gateway Proxy and Terminal Proxy)		
Survivable Elements	Call Server, Media Gateways including Media Gateway 1000B, and SRG portfolios	SRG portfolio and Media Gateway 1000B	
Environmental			
Input Voltage	Call Server:		
	ac: 110 to 240 V, 50/60 Hz dc: -48 V	ac: 240 V, 50/60 Hz dc: -8 V	ac: 110 to 240 V, 50/60 Hz dc: N/A
	Signaling Server:		
	ac: 100-240V, 50/60 Hz dc: N/A		
	Media Gateway:		
	MG 1000 and MG Expansion: ac: 110 to 240 V 50/60 Hz dc N/A	Integrated MG / IPE Module: ac: 240 V 50/60 Hz dc: -48V	MG1000 and MG Expansion: ac: 110 to 240 V 50/60 Hz dc N/A

Dimensions

Signaling Server:		
Width: 42.67 cm (16.8 in.) Depth: 55.88 cm (22.0 in.) Height: 4.3 cm (1.7 in.) Weight: 9.1 kg (20 lb) per unit		
Call Server:		
Width: 43.9 cm (17.3 in.) Depth: 34.3 cm (13.5 in.) Height: 9.7 cm (3.8 in.) Weight: 8.6 kg (18.9 lb)	(Core/Net Modules) Top Cap Width: 81.3 cm (32 in.) Depth: 55.88 cm (22 in.) Height: 10.2 cm (4 in.) Weight: 6.8 kg (15 lb) Module(s) Width: 81.3 cm (32 in.) Depth: 55.88 cm (22 in.) Height: 86.4 cm (34 in.) Weight: 172.7 kg (380 lb) Pedestals(s) Width: 81.3 cm (32 in.) Depth: 66 cm (26 in.) Height: 25.4 cm (10 in.) Weight: 36.4 kg (80 lb)	Width: 44.2 cm (17.4 in.) Depth: 39.4 cm (15.5 in.) Height: 13.2 cm (5.2 in.) Weight: 13.2 kg (29 lb)
Media Gateway:		
1000S and 1000E Expansion Width: 43.7 cm (17.2 in.) Depth: 32.5 cm (12.8 in.) Height: 21.3 cm (8.4 in.) Weight: 13.6 kg (30 lb)	Integrated MG/IPE Module) Top Cap Width: 81.3 cm (32 in.) Depth: 55.9 cm (22 in.) Height: 10.2 cm (4 in.) Weight: 6.8 kg (15 lb) Module(s) Width: 81.3 cm (32 in.) Depth: 55.9 cm (22 in.) Height: 43.2 cm (17 in.) Weight: 86.25 kg (190 lb) Pedestals(s) Width: 81.3 cm (32 in.) Depth: 66 cm (26 in.) Height: 25.4 cm (10 in.) Weight: 31.8 kg (70 lb)	1000S and 1000E Expansion Width: 43.7 cm (17.2 in.) Depth: 32.5 cm (12.8 in.) Height: 21.3 cm (8.4 in.) Weight: 13.6 kg (30 lb)

Nortel Media Gateway Portfolio

Nortel offers a wide variety of remote gateway solutions that extend enterprise communications to teleworkers and remote offices. Enterprises that use a Nortel Media Gateway 1000B can have as many as 400 users distributed across an IP WAN in a survivable environment. The Media Gateway 1000B supports the same analog and digital line and trunk cards and phones regardless of location.

Nortel innovative remote products allow enterprise customers to choose the solution that best fits their needs based on branch office size, feature requirements, environment, and budget.

Nortel Media Gateway 1000B



Overview

The Nortel Media Gateway 1000B allows large user group distribution across an IP WAN to branch office sites with seamless feature and application transparency with a Communication Server 1000 at the main site. The Media Gateway 1000B supports as many as 400 IP users. Management of IP phones at remote offices occurs from the main site. The Media Gateway 1000B provides access to an array of PSTN trunk types as well as line interfaces at the branch office. Survival mode engages automatically if the IP WAN fails. During an IP WAN failure, IP Phones continue to perform without compromising available features. Upon resolution of the network failure, the IP WAN reverts to normal mode.

Ideal For

- Enterprise customers with a main office and multiple branch and remote offices with 80 to 400 users.
- Enterprise customers that want centralized management of branch solutions.
- Enterprise customers that require survivability of branch and remote offices.
- Enterprise customers that want to deploy a mix of analog, digital, and IP Phones at their branch sites.

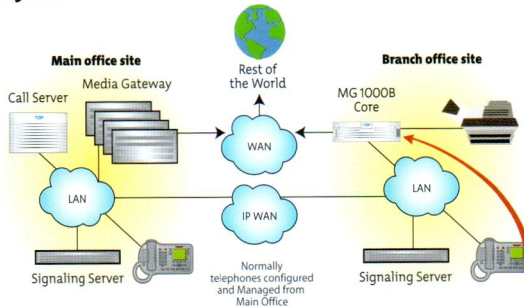
Business Challenges

- Do you want investment protection and scalable solutions that grow with the branch?
- Do you need to deliver consistent communication services to all employees regardless of physical location?
- Do branch employees need to share productivity tools such as unified messaging?
- Do you want to streamline costs for trunk and network management?
- Are reliability and availability critical to your branch office?

Typical Applications

- Large branch offices, such as hospital clinics, school districts, banks, or sales offices, that want to benefit from the features and functionality of a central corporate PBX while still providing a local presence in the distant community.
- Multisite enterprises that want to share Nortel Messaging and Nortel Contact Center applications with remote sites over converged voice and data networks.
- Customers with branch-level, mission-critical operations.

Network Diagram



Key Points

- The Media Gateway 1000B extends Communication Server 1000 features from a main office to a remote office.
- You can purchase the Media Gateway 1000B as new hardware or you can convert an existing Small System (Meridian 1 – 11C) into a Media Gateway 1000B. The functionality is the same in both configurations with one additional feature (Meridian Mail) supported in the converted system.
- The Media Gateway 1000B platform includes an MG 1000B Core connected to an IP PBX at the main office over a LAN or a WAN. A secondary location can centralize the call processing of the IP-based communication network. The call server at the main office provides the call processing for the IP Phones in both the main office and branch office locations.
- The Media Gateway 1000B provides call-processing functionality to local digital telephones and analog devices. The Media Gateway 1000B also provides digital and analog trunk access to the local PSTN.
- If the main office fails to function, or a network outage occurs, the Small System Controller (SSC) card in the MG 1000B Core provides service to the telephones at the branch office location. IP Phones can survive the outage between the branch office and the main office.
- Main office can be any of the following servers:
 - Communication Server 1000S
 - Communication Server 1000M
 - Communication Server 1000E

- Communication Server 1000M
- Communication Server 1000E

- More than one branch office location can be associated with a single main office, with a branch office associated with more than one main office.
- A branch office works with a main office only if the two offices use a common dialing plan.

Features and Benefits

- Cost reduction:** provides remote users access of applications from the main site, including Nortel Messaging and Contact Center Manager.
- Peer-to-peer networking:** offers all of the advantages of direct IP to IP calls and intelligent VoIP call routing through the centralized H.323 Gatekeeper.
- Geographic distribution:** the main site is aware of the trunks at the remote location so it is truly a single system that is distributed geographically yet intelligent.
- 911 support:** sends out remote location calls using a trunk that is local to the remote.
- User consistency:** provides the same user experience at the branch as main site users experience to simplify training needs and save money.
- Trunk interfaces:** provide a wide range of trunk interfaces at the remote location, such as DTI, PRI, BRI, analog, and IP.
- Survivability:** transforms the WAN network into a fully independent IP PBX system using a Nortel Media Gateway 1000B.

Technical Specifications

Features	MG 1000B – New System	MG 1000B – Converted Cabinet	MG 1000B – Converted Chassis
Scalable capacity	400 users	400 users	400 users
Dimensions	Width: 43.9 cm (17.3 in.) Depth: 8.9 cm (3.5 in.) Height: 9.7 cm (3.8 in.) Weight: 11.8 kg (26 lb)	Each cabinet is: Width: 55.9 cm (22 in.) Depth: 35.6 cm (14 in.) Height: 63.5 cm (25 in.) Weight: 34.1 kg (75 lb) (fully loaded)	Each Chassis is: Width: 43.7 cm (17.2 in.) Depth: 32.5 cm (12.8 in.) Height: 21.3 cm (8.4 in.) Weight: 13.6 kg (30 lb) (fully loaded)
Power (North America)	100 – 120 V – 15 Amp Supply 50 / 60 Hz	ac 100-240 Volts single phase 50/60 Hz dc –4 V to -54V 12 Amps	ac Power Installed in Chassis Universal 100-240 V ac input. 363 Watt total output power

Survivable Remote Gateway Portfolio



Overview

The Nortel Survivable Remote Gateway (SRG) portfolio offers a low-cost alternative to the Media Gateway 1000B for small IP Branch offices. In addition to the Nortel Survivable Remote Gateway 200 and SRG400, Nortel offers a small model with SRG50 (5 to 32 users) that supports Communication Server 1000 software releases 3.0, 4.0, and 4.5. The SRG products seamlessly extend the services and applications of a Nortel Communication Server 1000 Series system while providing business continuity and survivability for small remote sites and branch offices.

The SRG series provides continued telephony services for IP clients under network and system failure conditions and cost-effectively at small locations. Nortel based the Survivable Remote Gateway 50 on the Nortel Business Communication Manager 50 and based the SRG200/400 platform on the market-leading small-site IP telephony solution and the Nortel Business Communications Manager 200 and 400.

The SRG portfolio is cost-effective at small sites and is a proven reliable solution that includes the intelligence to drive Nortel IP terminals while providing IP routing capabilities and a suite of PSTN interfaces to enable local PSTN access. The SRG products address the needs of small branch offices with 5 to 90 users.

- Nortel Survivable Remote Gateway portfolio
 - Survivable Remote Gateway 200/400/50

Survivable Remote Gateway 200/400/50

Overview

The SRG acts as an H.323 WAN Gateway connected to an IP PBX at the main office to extend Communication Server 1000 features to a small branch office. A secondary location can centralize the call processing of the IP-based communications network and can provide consistent desktops and applications across the network, branch survivability, and E911 access if a network failure occurs.

The Survivable Remote Gateway is available in two versions:

- Survivable Remote Gateway 1.0 - Business Communications Manager 200/400 3.6+ with SRG 1.0 Authorization Code (supports up to 90 IP stations)
- Survivable Remote Gateway 50 - Business Communications Manager 50 with SRG50 Authorization Code (supports up to 32 IP stations)

Ideal For

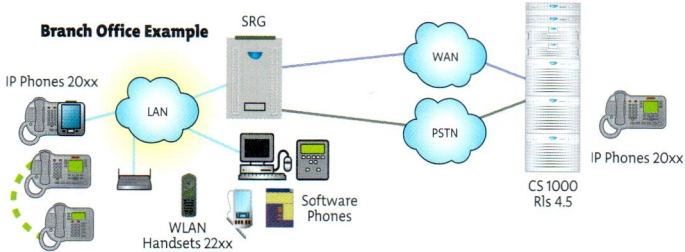
The SRG200/400 and SRG50 are ideal for any business with branch office locations or remote sites. The portfolio is well suited to:

- existing Nortel enterprise customers that want the business features and service capabilities of a Nortel Meridian 1 on an IP telephony communications server delivered with Nortel Communication Server 1000 extended to remote sites with survivability
- companies that want a scalable IP PBX that offers a redundant call server with services extended to remote sites with survivability
- companies with one or more of the following issues:
 - c-level executive requirement to use leading-edge technology—converged solutions
 - an interest in building on a data network for IP-based converged applications
 - a desire to standardize voice services at remote sites after acquisitions
 - the opening of new branch offices
 - outgrown, fully depreciated, or lease expiration on an existing PBX or key system

Business Challenges

- Have you thought about creating a communications infrastructure that is easier to manage than your current infrastructure?
- Have you considered the cost savings to move to an IP telephony-enabled network?
- Are you concerned with increasing employee productivity?
- Are you concerned about the cost of network access fees and toll charges between your offices?
- Do you want a solution so your employees can collaborate and communicate more effectively with one another?
- Do you need to extend desktop applications and features across your network to include your remote users?
- Do you want an effective way to accommodate mobile workers?
- Do you want a survivable branch office solution?
- Do you want an effective way to accommodate geographically dispersed contact center agents?

Network Diagram



Typical Applications

Today, enterprises increasingly consider the benefits of installing IP voice solutions because of the multiple business benefits. One of the main benefits is the ability to centralize applications and service platforms. Another is to provide access to these services simply by enabling a WAN connection between locations.

Cost-optimized for branch locations supporting 5 to 50 users, the Nortel SRG solutions seamlessly extend the services and applications of a Nortel Communication Server 1000 or 1000M system from a headquarters site to small remote sites. IP telephony users benefit from the rich features and applications and the low cost of ownership associated with a centralized Nortel Communication Server 1000/1000M system, while helping to ensure that a basic set of features is available to those same users if WAN, network failure, or performance issues compromise IP connectivity to the main Nortel Communication Server 1000 location.

Businesses install Nortel SRG solutions as a key component of a Nortel Communication Server 1000 solution. Consequently, a survivable remote gateway is part of an IP Telephony solution that provides industry-leading features as well as productivity-enhancing and revenue-generating applications to enterprises across all industries.

Key Points

The SRG portfolio is based on the award-winning, market-leading Nortel Business Communication Manager 400/200/50 platforms. The platforms include voice services, voice applications and data networking services to provide unsurpassed flexibility in meeting current and future communication needs of enterprises. Cost-effective at small sites, these solutions are reliable and include the intelligence to drive the common Nortel suite of IP terminals and provide VoIP gateway and PSTN interfaces to enable local PSTN access. In addition, the SRG products already include extensive interoperability capabilities with the Nortel Communication Server 1000 platform through the H.323 standard. Plans are in place to add support for interoperability through H.323 for the Nortel MCS 5100, Nortel Communication Server 2100 and Nortel Communication Server 2000. The platform is an integral part of the Nortel enterprise portfolio. The portfolio continues to evolve and expand capabilities to cost-effectively meet customer needs in the small-site IP solutions market.

The Nortel SRG portfolio extends the Nortel Communication Server 1000 desktop feature and user interface to remote users and gives these users full access to the same applications as those available at the main site. Remote users can share applications such as Nortel Messaging, Nortel Contact Center, and many others. Because the Nortel Communication Server 1000 and Nortel

SRG solution allow distribution of trunks across the WAN, remote users can have dial tone from their local central offices or from any other IP telephony gateway hosted by a Nortel Communication Server 1000. The Nortel SRG portfolio also provides a full suite of IP-based data and routing capabilities including DHCP, Web caching, and firewall protection.

Features and Benefits

With a Nortel SRG solution, a business can:

- **Streamline costs**

- **Improved network management:** The support of voice and data networks is a major annual business expense as more business-critical processes move online. Converged networks offer solid opportunities to improve technical support through simplified networks and centralized or remote management. The Nortel SRG portfolio offers complete remote access to all system management information and administration processes. Administrators can program and manage a Nortel SRG from any PC on the network using the BCM Element Manager and the Communication Server 1000 Telephony Manager 3.0. With Nortel SRG, businesses can easily isolate trouble spots by delivering improved event descriptions and identification. Unlike the Remote Gateway 1000B, Nortel SRG provides only the critical system services to IP terminal users when they are disconnected from the main Nortel Communication Server 1000/1000M. Streamlined programming needs at the branch office site reduce the total cost to provision or support the office.
- **A single box solution:** Besides supporting telephony, Nortel SRG delivers IP routing capabilities that include support for VPN and a full suite of data services such as DHCP and Web caching. If an enterprise opens a new office, Nortel SRG eliminates the need for an external router in most cases, thereby reducing up-front costs. If the organization wants to use an existing router, Nortel SRG performs flawlessly in that environment as well.

- **Distribution of trunking across the WAN:**

Despite the drop in toll charges over the past several years, telecommunications service budgets continue to grow as new applications place further demands on the network. Converged networks increase the use of existing network resources while potentially reducing the number of required network resources. Convergence also applies to network access. Nortel SRG supports local PSTN access to the remote site. Organizations can contact the branch using a local telephone number and branch employees use a local telephone number for external calls. In addition, users at the main office (on the Nortel Communication Server 1000) can use the Nortel SRG branch trunks to contact customers local to that branch. Customers save money by contacting the business using a local telephone number.

- **Improve productivity**

- **Consistent features and applications:**

Simplification cuts operating costs, increases employee productivity, and strengthens the business for long-term success. SRG extends the powerful and intuitive features of the Nortel Communication Server 1000 to small remote sites, to provide users access to the same set of features and applications, such as unified messaging, conference-bridge, and contact center, that users at the main site enjoy. Employees at all sites communicate effectively with each other and are productive.

- **Coordinated dial plans:** With Nortel SRG, a business can establish a single numbering plan for all locations so employees can easily contact their co-workers at other locations. The business manages and configures this dialing plan for its central location.

- **Distributed contact center agents:** Nortel SRG allows geographic independence of contact center agents, supporting them through a single call server. The advantages to the enterprise include

increased revenues and low costs that result from reduced overhead. Contact center agents benefit from not being restricted to a single location.

- **Improved business continuity**

- **Survivability:** In normal operating mode, the IP sets on the Nortel SRG communicate transparently from the branch office to the Nortel Communication Server 1000. When the branch office is isolated from the Nortel Communication Server 1000 for any reason, such as WAN failure, the IP sets reregister to the Nortel SRG. Users can access a set of critical telephony services allowing them to continue to do business and access

emergency personnel if necessary.

- **Emergency number support:** Nortel SRG provides local PSTN access for emergency calls (for example, 911 calls in North America). This support helps to ensure emergency personnel respond quickly to the correct location.
- **Security:** With the recent rash of worms and viruses on the public IP network, network security and vulnerability is a concern. Nortel SRG includes a full set of security features that include SSL and IPSec for remote management connections and firewall protection.

Technical Specifications

Features	Nortel Survivable Remote Gateway 200	Nortel Survivable Remote Gateway 400	Nortel Survivable Remote Gateway 50
Capacity	90 IP Stations	90 IP Stations	32 IP Stations
Terminals Supported	• Nortel IP Sets (2001, 2002, 2004, 2007, IP SoftPhone 2050 and MVC 2050) • Analog Sets • WLAN Sets 2210/2211	• Nortel IP Sets (2001, 2002, 2004, 2007, IP SoftPhone 2050 and MVC 2050) • Analog Sets • WLAN Sets 2210/2211	• Nortel IP Sets (2001, 2002, 2004, 2007, 2033; IP SoftPhone 2050 and MVC 2050) • Analog Sets • WLAN Sets 2210, 2211 and 2212
PSTN Interfaces Supported	All BCM trunk MBMs – Global Analog Trunk, Digital Trunk (T1/PRI), BRI	All BCM trunk MBMs – Global Analog Trunk, Digital Trunk (T1/PRI), BRI	All BCM trunk MBMs – Global Analog Trunk, Digital Trunk (T1/PRI), BRI
Applications	Hosted by main site – no local applications	Hosted by main site – no local applications	Hosted by main site – no local applications
Dimensions	Width: 46.5 cm (18.3 in.) Depth: 44.5 cm (17.5 in.) Height: 8.9 cm (3.5 in.)		Width: 30.48 cm (12 in.) Depth: 21.59 cm (8.5 in.) Height: 5.08 cm (2 in.)
Power	Standard Power Supply : autosensing; 300 Watts; 90/264 V ac; 6.0A / 3.0A, 60/50 Hz Redundant Power Supply: SRG200/400) (BCM 400) only autosensing; 350 Watts; 90/264 V ac; 7.0A / 3.5A, 60/50 Hz		External Power Supply

Remote Gateway 9100 Series

Overview

The award-winning¹ Nortel Remote Gateway 9100 series provides an ideal solution to extend cost-effective, high-quality communications to remote user, whether an individual at home or a group of employees at remote offices. The Nortel Remote Gateway 9115 extends the features and functions of a Nortel Meridian 1 PBX, Meridian SL-100, or Communication Server 1000 system to a single telephone at a small remote office or home office. The Remote Gateway 9100 series uses a standard IP-based network connection or an analog PSTN telephone line and a Nortel Meridian digital telephone. The Nortel Remote Gateway 9150 is a powerful choice to extend these features and functions to remote branch offices using as many as 32 Nortel Meridian digital telephones and a standard IP-based connection or PSTN circuit-switched telephone lines. With each Nortel Remote Gateway solution, the remote workers have full access to the corporate telephone network as if they work at the main corporate site. Remote office users enjoy all the more than 450 features and system resources such as unified messaging, the corporate directory, and corporate dial plans as well as features such as "boss-secretary filtering," "audio conferencing," and "automatic call distribution," available to users at the main office.

Businesses use the Remote Gateway 9100 Series Configuration Manager software, a Windows-based application, to maintain and configure Remote Gateway 9100 series. The software provides a simple configuration wizard for initial installation that prompts for the minimum information needed to get the remote site to communicate with the main site.

After the initial configuration, the user opens the Configuration Manager to administer remote gateways. Administration tasks include:

- viewing system status
- performing upgrades or backups
- configuring changes
- changing the administration password

Remote Gateway 9115

The Nortel Remote Gateway 9115 teleworker and telecommuting solutions feature patented, quality of service (QoS) transitioning technology that assures voice quality and reliability. The Remote Gateway 9115 allows the transition of live calls between the IP network and an analog telephone line.

Ideal For

- home-based employees
- executive home-based offices
- occasional remote workers
- contact center agent teleworkers (a single agent working from home or remote site)
- remote jobsite support (small temporary field or project offices)
- support personnel (pager duty or on-call personnel)
- small branch offices (2 to 3 phones without ISDN BRI ability and little internal phone-to-phone traffic)

Business Challenges

- Do you have small branch offices without ISDN BRI ability and little internal phone-to-phone traffic?
- Do you need to provide your work-at-home employees with access to all of the tools and applications available at the office?
- Are you considering remote agents for your contact center?

Typical Applications

- Any enterprise benefit from the Remote Gateway 9100 series of products that needs to extend its network access to outlying communities and wants teleworkers to work efficiently and cost-effectively.
- Call center agents responding to calls from their homes or employees working in remote locations with the flexibility of a home office environment.

Key Points

- Enterprises can capitalize on the investment of a Nortel Meridian 1, Meridian SL-100, or Communication Server 1000 communications system across home offices, support personnel, remote contact center agents, and more.
- Feature richness where all Nortel Meridian 1 and Communication Server 1000 applications are supported: telephony features, Nortel Contact Center - Manager, Nortel Messaging, Nortel Meridian Mail, and Nortel TAPI Server.

- System administration under Communication Server 1000 Telephony Manager.
- Quality of service (QoS) guaranteed.
- Cost-effective for home office and remote worker solutions without sacrificing features, functions, quality, and reliability.

Features and Benefits

- **Integrated solution:** requires no external equipment on the host Nortel Meridian 1 or Communication Server 1000 system. All that is required is a 16- or 32-port Remote Gateway reach line card (RLC) installed in the Nortel Meridian 1 or the Communication Server 1000 system. RLC ports also support Nortel Remote Gateway 9150 extensions and locally attached digital sets.
- **Capitalization on application investments:** allows remote users, regardless of location, to share Nortel Messaging, Nortel Meridian Mail, and Nortel Contact Center applications at the main host site.
- **Flexible access options:** extend standard Nortel Meridian digital telephones over an IP network or circuit-switched analog lines. A 10baseT Ethernet interface enables connectivity to the IP network or to any other WAN access device such as cable modem or XDSL.
- **Survivable:** sustains connectivity if the connection from the remote site to the Nortel Meridian 1 or Communication Server 1000 is lost; survivability is provided because the analog lines allow local incoming and outgoing calls for all remote users.
- **Quality of service (QoS) transitioning:** establishes a connection over the analog line interface to the host Nortel Meridian 1 or Communication Server 1000 system if QoS falls below acceptable programmed thresholds. The call-in-progress moves dynamically from the IP network to the analog line to help ensure voice quality.
- **Local calling:** provides an analog line at the remote office to place or receive calls. Calling

within the local community (local presence) occurs directly through the local telephone community, rather than through the host system, which can be in a distant city. The local calling feature reduces unnecessary call charges.

- **Multiple users per port:** supports three methods of sharing ports between users on the RLC:
 - The dedicated port configuration assigns a fixed port to a particular user for all calls. No other user may use this port.
 - The multi-user ports allow up to 20 remote teleworkers to access a specific telephone configuration (RLC port) on a shared basis and accessing the assigned line card port one at a time.
 - The dynamic pool ports can be used in a contact center environment. Remote agents can call a specific number and be assigned to an available port. The

telephone configuration is not important because the agent ID used when logging in identifies the user for routing of calls and report detail.

- **Full remote agent functionality:** provides all contact center functionality available to local agents at the PBX. Management reports and supervisor monitoring include both local and remote agents. The Nortel Remote Gateway 9110 and 9115 support third-party call control CTI applications. CTI applications monitor and intelligently control incoming and outgoing calls to the remote telephone.
- **Efficient use of bandwidth:** supports multiple compression algorithms to maximize call quality or maximize use of bandwidth between the Nortel Remote Gateway Series users and the PBX.

Remote Gateway 9150



Overview

A powerful option for remote offices, the Nortel Remote Gateway 9150 capitalizes on investment in Nortel Meridian 1 and Meridian SL-100 systems by extending communications to branch offices using as many as 32 Nortel Meridian digital telephones.

Ideal For

- multisite enterprises that want to capitalize on the investment in their Nortel Meridian 1, Meridian SL-100 or Communication Server 1000 by cost-effectively distributing high-quality communications capabilities over IP throughout the entire organization
- enterprises that need to cost-effectively support small remote offices with as many as 32 users
- teleworking centers that want transparent connections for remote workers or contact center agents to a Nortel Meridian 1, Meridian SL-100, or Communication Server 1000
- school districts extending from a central site with centralized voice mail
- Small clinics and doctor offices extending from a main hospital
- Banks, credit unions, and other financial service organizations with numerous remote sites

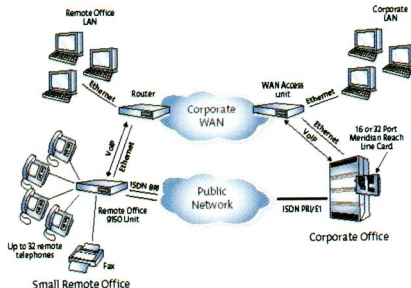
Business Challenges

- Do you want investment protection and scalable solutions that grow with the branch?
- Do you need to deliver seamless communication services to all employees regardless of their locations?
- Do you need its branch employees to share productivity tools such as unified messaging?

Typical Applications

- Small branch offices that want to benefit from the features and functionality of a central corporate PBX while still providing a local presence in the distant community served (bank and credit union branch offices, doctor offices and clinics associated with a major hospital, regional sales and service support centers, a remote agent contact center at the local shopping center)
- Small branch offices that want to seamlessly share Nortel Messaging and Nortel Contact Center applications with remote sites over converged voice and data networks
- Small branch offices that want to Increase the productivity of distributed workforce services, mobility, and unified messaging
- Small branch offices that want to enhance quality of service (QoS) levels

Network Diagram



Key Points

- Cost-effective branch solutions capitalize on customer investments from high-value features and applications at host site.
- Scalable remote solution provides as many as 32 users cost-effective access to Nortel Meridian or Communication Server 1000.
- Flexible access options extends digital telephones using IP network or ISDN BRI lines.
- Reduction in toll charges brings the dial tone from the host Nortel Meridian 1 or local central office to the small branch offices.
- Simplified management reduces the number of databases that need support.
- Efficient use of bandwidth offers multiple voice compression options.
- High voice quality maintains high voice quality using QoS transitioning technology. The Nortel Remote Gateway 9150 offers a voice QoS feature that automatically switches to the circuit network if IP congestion affects voice quality and switches back to IP when the WAN restores voice QoS. Switching between IP and circuit switched networks is transparent to the user.

Features and Benefits

- All Nortel Remote Gateway series products communicate with the Nortel Meridian 1 or Communication Server 1000 communication systems using a single slot or dual slot reach line card (RLC). This flexible integrated application card simultaneously supports Nortel Remote Gateway series 9150-based branch offices, 9110 and 9115 telecommuters, Nortel Meridian digital phones with the Nortel Digital Telephone IP Adapter, and directly wired Nortel Meridian digital phones
- The Nortel Remote Gateway 9150 is a flexible solution. It is installed in PSTN-only, IP-only, or IP- and ISDN-together modes, depending on which access method is available to the remote user.
- The Nortel Remote Gateway 9150 allows centralized administration and control of branch office telephones, a consistent user interface between branch offices and

headquarters, and centralized application support, such as Nortel Messaging and Nortel Contact Center.

- The Nortel Remote Gateway 9150 is fully survivable if the branch office loses IP connectivity with the headquarters office.

Market Information

While some IP telephony vendors use proprietary protocols to implement routing across the network, Nortel solutions feature Open Networks. Nortel remote products work across any QoS-capable network. Unlike many other IP telephony products from other vendors, the Nortel Remote Gateway 9100 series can help to ensure voice quality and reliability because systems can place and receive phone calls over circuit-switched analog PSTN lines as well as over IP network connections. When IP performance levels drop, live, active calls move from the IP network to PSTN fallback lines without dropping the call or sacrificing voice quality.

Because businesses have different requirements, the Nortel comprehensive portfolio provides multiple branch office options. Customers can choose a solution based on individual requirements. The addition of the SRG 50 provides an extremely cost-effective solution for the small branch office.

Technical Specifications

Features	Nortel Remote Gateway Series 9115	Nortel Remote Gateway 9150
Scalable capacity	• 2-3 telephones	• 8 – 32 telephones
Interfaces	• Single analog POTS • 10BaseT Ethernet	• Up to four U or S/T ISDN BRI interfaces • 10BaseT Ethernet • One analog port
Compatible handsets	• Support Nortel Meridian Desktop portfolio M2000 and M3900 sets plus add-on modules	• Supports Nortel Meridian Desktop portfolio M2000, M3900 and M3900 sets plus add-on modules
Host site	• 16- and 32-port reach line cards • Ethernet interface for IP telephony • Shared ISDN PRI/T1/E1 PBX trunking to remote sites	• 16- and 32-port reach line cards • Ethernet interface for VoIP • Shared ISDN PRI/T1/E1 PBX trunking to remote sites
Nortel Meridian feature and application support	• All Nortel Meridian 1 and CS1000 applications • Telephony features • Nortel Contact Center • Supports first-party and third-party CTI • Nortel Messaging • Nortel Meridian Mail	• All Nortel Meridian 1 and CS1000 applications • Telephony features • Nortel Contact Center • Supports first-party and third-party CTI • Nortel Messaging • Nortel Meridian Mail
Standards Compliant	• TAPI using Nortel TAPI Server service provider (first party or third party mode) • IEEE 802.1p: layer 2 QoS • DiffServ: layer 3 QoS • NAT-P: network address translation	• TAPI using Nortel TAPI Server service provider (first party or third party mode) • IEEE 802.1p: layer 2 QoS • DiffServ: layer 3 QoS • NAT-P: network address translation
Transparent access to all Nortel Meridian and CS features (from the remote location)	• Nortel Messaging, message lights, Nortel ICB conference bridge • Same phones and user interface whether at remote site or at main site • Phones can be programmed identically to local phones, including a copy of an existing phone (one phone number rings at both a remote and local office phone—MADN multiple appearance directory number) • Remote phones have the same access as local phones to call center and other applications	• Nortel Messaging, message lights, Nortel ICB conference bridge • Same phones and user interface whether at remote site or at main site • Phones can be programmed identically to local phones, including a copy of an existing phone (one phone number rings at both a remote and local office phone—MADN multiple appearance directory number) • Remote phones have the same access as local phones to call center and other applications
Connection to Nortel Meridian host	• Ethernet interface for IP telephony • Analog POTS • G.729 (8 Kb/s) encoding back to the Nortel Meridian 1, Meridian SL-100, or CS1000 on a single analog POTS	• Ethernet interface for IP telephony • ISDN BRI • G.729 (8 Kb/s) encoding supports up to 8 simultaneous calls back to the Nortel Meridian 1 or CS1000 on a single ISDN B channel (14 calls on 1 BRI)

Survivable	• If WAN connection lost to main system, local line allows local outgoing and incoming call for remote users	• If WAN connection lost to Nortel Meridian, local station-to-station calls supported • ISDN BRI lines allow local outgoing and incoming calls for remote users
Local switching	• Not Available	• Station-to-station calls are switched locally saving bandwidth to host system
Audio compression	• G.711, G.729a, 30 ms voice samples	• Supports multiple codecs to maximize WAN bandwidth
QoS transitioning	• Dynamically switches calls from packet networks to analog POTS line when IP performance degrades	• Dynamically switches calls from packet networks to circuit-switched networks if voice quality degrades
Voice activity detection	• Voice activity detection (sometimes called silence suppression) can dramatically reduce the amount of IP traffic generated during a voice conversation. The voice activity detection feature allows one side (or both) of an IP telephony connection to stop sending traffic when nobody is speaking on that side.	• Voice activity detection (sometimes called silence suppression) can dramatically reduce the amount of IP traffic generated during a voice conversation. The voice activity detection feature allows one side (or both) of an IP telephony connection to stop sending traffic when nobody is speaking on that side.
Dimensions	Remote Gateway 9115 unit dimensions are: Width: 18.2 cm (7.2 in.) Depth: 9.9 cm (3.9 in.)	The Remote Gateway 9150 unit dimensions are: Width: 42.5 cm (17 in.) (without rack-mounting brackets) Depth: 29.4 cm (11.75 in.) Height: 4.4 cm (1.75 in.)
Power	Voltage Current 24 V dc 0.3A	Autosensing 110/220V power supply

Ordering Information

For further information, contact your local Nortel representative.

Nortel Application Gateway 1000

Overview

The Nortel Application Gateway (AP) 1000 software is a standards-based network platform that supports voice and data services. The AP1000 delivers applications securely and in real time to the screens of IP telephones as a cost-effective alternative to PCs, computer terminals, and other data entry devices, as well as wireless devices such as Personal Digital Assistants (PDA), BlackBerry handhelds, and Web-enabled cellular telephones.

Ideal for

The Nortel Application Gateway 1000 is ideal for businesses that want to bring the benefits of IP Telephony to their organizations. The AP1000 is well suited for:

- businesses that want to offer the Nortel Voice Office Applications suite to deliver practical, converged voice and data applications to their end users
- businesses that want to increase productivity and enhance organizational communications
- businesses that want visual voice mail on an IP Phone without a PC
- businesses that need to communicate effectively during emergencies and disasters.

Business Challenges

- Do you want to reduce the number of applications your end users need to master?
- Do you want to reduce the time your employees spend looking up telephone numbers?
- Do you want to reduce costs to train employees to use their voice mail?
- Do you need a zone paging application to communicate effectively during emergencies and disasters?

Key Points

- Express Directory in the Voice Office Application suite reduces the time to look up and dial numbers by 75 percent, compared to an existing telephone switch directory.
- The Click-to-Call with Smart Agent application enables users to initiate telephone calls from their desk phones by selecting the telephone numbers that appear in e-mails or Web applications.
- The Application Gateway 1000, not the IP phone, manages security and then transforms data to display and control characteristics specific to the Nortel IP phone model that uses the application.

Typical Applications

- **Health care:** Touch screen and keyboard simplify user input.
- **Retail:** USB port on 2007 IP Phone enables the use of card swipe, bar code scanners, and radio frequency identification (RFID).
- **Hospitality:** Deliver guest services information and rotating advertisements to the screen of the phone.

Features and Benefits

- **Visual voice mail:** offers easy access to voice mail.
- **Zone paging:** lets organizations spread word quickly and cost-effectively during emergencies and disasters.
- **Express Directory:** reduces the time needed to look up telephone numbers.
- **Broadcast alerts:** enable real-time communications during emergency and nonemergency situations.
- **Click-to-Call:** lets end users dial a number from their desk phones with one click.
- **Guest services:** allows hotels to personalize guest services.

Technical Specifications

Application Gateway 1000 specifications	• Rack mount form factor • Supports up to 500 IP phones per Application Gateway 1000 for Voice Office • Up to 5 Application Gateway 1000s can be clustered (if more than 500 IP phones are supported)
Nortel software release requirements	• Communication Server 1000 Release 4 or higher • CallPilot release 2 or higher with Unified Messaging Enabled for Visual Voicemail
Click-to-Call application support	• Internet Explorer 6.0 and higher • Microsoft Outlook XP/2000/2003, Outlook Express 6.0, and Qualcomm Eudora 6.2
The Broadcast Server requires an additional PC that operates on the English versions of the Microsoft Windows operating systems	• Windows 2000 Server SP • Windows 2003 Server • 2002 IP Phone, Phase II D9G and higher • 2004 IP Phone, Phase II D9G and higher • 2007 IP Phone, C2A and higher • 1120E IP Phone, C1C and higher • 1140E IP Phone, C1C and higher
IP phones and firmware compatible with Guest Services applications	• 2007 IP Phone, C2A and higher

Voice Office or Guest Services Licenses (one for each IP phone required) can be ordered in quantities of 10, 50, 250, and 1000.

Ordering Information

For further information, contact your local Nortel representative.

Nortel Communication Server 1000 Telephony Manager 3.0

Overview

The Nortel Communication Server 1000 Telephony Manager 3.0 is a sophisticated package of management tools that provides a single point of access to manage Nortel Communication Server 1000 and Meridian 1 PBX systems. The Communication Server 1000 Telephony Manager is an integral part of the Nortel strategy to help companies lower their ownership costs to operate and manage next-generation telephony networks. Companies can rely on the Communication Server 1000 Telephony Manager integrated suite of management tools for configuration, control, and analysis of their telephony networks, either through a Web browser interface or a few specific applications that run as Windows clients. In addition, the Communication Server 1000 Telephony Manager integrates easily with other Nortel management products to provide a complete management view of a converged network infrastructure.

Ideal For

- Large and small businesses.
- Businesses that want to simplify and improve the management of their Nortel Communication Server 1000 and Meridian 1 PBXs in their communications network.
- Businesses that want to minimize downtime with consolidated alarm view and alarm notification features.
- Businesses that need effective tools to monitor and report on network and services use, to improve performance and planning.
- Businesses that need LDAP or Microsoft Active Directory integration to serve various business applications in their networks. Telephony Manager enables automatic LDAP or Microsoft Active Directory synchronization of user parameters in the Common Network Directory without administrator intervention.

Key Points

- User-friendly GUI helps customers quickly perform routine management tasks and reduce the learning curve.
- End-user self-management capabilities free skilled resources.
- Single point of data entry results in a reduced data-entry time, improved data entry accuracy, and elimination of duplicated effort.
- Consolidated view of network elements provides easy access to configuration applications.
- Unified alarm management monitors the health of a network from a single Web interface.

- Extended administration reach enables access to documentation, phone configuration, and CLI from anywhere.
- Scalability adds applications and management capacity as required.
- Complete management functionality uses a Web-based interface for most day to day tasks such as performing moves, adds, and changes (MAC).
- Affordable solution satisfies large and small enterprise needs.

Features and Benefits

- **Single management platform** provides a single management platform while other vendors offer multiple management applications that run on disparate operating systems to support different products, releases, and applications.
- **LDAP synchronization** can link the Telephony Manager directory to an external LDAP server. Communication Server 1000 Telephony Manager supports Microsoft Active Directory for Windows 2000 and 2003, and Sun Microsystems Java. LDAP synchronization saves the administrator from repeatedly entering common data.
- **Station administration** simplifies the day-to-day station moves, adds, and changes (MAC) to single and multiline phones. Using a Web interface, administrators can define templates, execute global changes, assign Directory Number (DN) and Terminal Numbers (TN), program feature keys, support scheduled

changes, and much more.

- **Web-based desktop services** provide end users with an easy-to-use online help; end users can have permissions to change features on their phones.
- **Alarm management** provides an alarm collection and processing center for multiple systems and devices. Telephony Manager receives SNMP traps from systems, such as the Nortel Meridian 1, Communication Server 1000, or CallPilot and stores the SNMP traps in a circular log file on the TM server. Notification is available using a pager system, facsimile, or e-mail when the system triggers certain alarms or thresholds are exceeded. Telephony Manager filters and forwards key alarms to the Nortel Enterprise Network Management System (ENMS), HP Openview, and other network management systems.
- **Web maintenance** allows administrators to quickly troubleshoot and diagnose potential problems through a Web browser. The maintenance application provides Web access to all of the overlay-based maintenance commands.
- **Traffic analysis** is a Windows client application that analyzes switch resources and provides information to forecast growth such as trunk usage, peak periods, processor loads, and loop traffic.
- **Telecom billing system** is a fully integrated telecommunications costing and billing application. The telecom billing system can collect call records and allocate costs to the appropriate users or departments using flexible cost models. The billing system also generates billing reports that support multiple currencies.
- **Call tracking** monitors call use patterns and provides an alarm-generating function, which can be set up to warn of unusual calling patterns.
- **Electronic Switched Network analysis** provides a simple way to create least-cost routing. Administrators can configure Electronic Switched Network (ESN) properties offline and upload them to multiple systems. Existing ESN databases can be copied, modified, and uploaded to a new system to save the administrator hours of configuration time. Electronic Switched Network analysis provides a global change capability for a high level of administrative efficiency.
- **Virtual terminal service** provides a single point of connectivity for a Web-based terminal window to the Nortel Meridian 1 system, Communication Server 1000 system, direct serial connection, and Telnet, for example, Integrated Recorded Announcer, Integrated Conference Bridge; the virtual terminal service also provides context-sensitive online Help for Nortel Meridian 1 overlays.
- **Corporate directory** enables enterprises to define parameters and generate reports from corporate station and user data associated with a terminal number. These reports can include up to 100 different data fields including name, extension, location, and department associated with each terminal number. This function puts the corporate directory information directly onto Nortel digital and IP telephones.
- **Access server** offers terminal server-like capabilities that provide access to TM using the command line interface (CLI) and pass input to a specific, connected device.

Ordering Information

For further information, contact your local Nortel representative.

Nortel Large IP Telephony Platform

Geographically dispersed enterprises or those with large campus environments can enjoy the robust features and scalability of The Nortel carrier-grade IP soft switch. Nortel Communication Server 2100 offers enterprises the best of both worlds: carrier-class reliability with enterprise features and applications. The Communication Server 2100 can implement a hybrid or pure IP network.

The Nortel Large IP Telephony platform includes the following:

- Nortel Communication Server 2100
- Nortel Communication Server 2100 software release SE09
 - XA Core platform
 - Compact platform
- Nortel Large Trunk Gateway portfolio
 - Media Gateway 15000
 - Media Gateway 7480
 - Media Gateway 3000 series
- Nortel Large Line Gateway portfolio
 - Media Gateway 9000
 - IP Client Manager 9.0
 - Third-party analog gateways

Nortel Communication Server 2100



Overview

Nortel Communication Server 2100 is the first carrier-grade, IP soft switch for large campus and geographically dispersed large enterprises. The super-class soft switch delivers the ubiquity, quality, and reliability of the traditional Time Division Multiplexing (TDM) telephony network on a next-generation packet network. Built on proven, industry-leading, Linux-based software, the Communication Server 2100 provides the reliability, redundancy, fault tolerance, and system robustness associated with carrier-grade switches, plus a full suite of enterprise business features. The Communication Server 2100 can scale from 5000 to 200 000 ports. With the Nortel Communication Server 2100, organizations can implement a hybrid or a pure IP network and preserve existing investments in TDM equipment while adding new IP capabilities. The Nortel Communication Server 2100 is the cornerstone of an IP solution for large enterprise implementations.

Ideal For

The Nortel Communication Server 2100 is well suited for:

- Government (federal, state and local)
- Manufacturing
- Universities
- Health care
- Financial institutions
- Fortune 500 companies

Business Challenges

Some of the business challenges to consider when deciding to use the Communication Server 2100 are:

- Do you need maximum, carrier-grade reliability?
- Do you need geographic survivability?
- Is network reliability critical to your company?
- Are you interested in data center consolidation?
- Do you want to lower your operating costs and simplify management?
- Do you need scalability support for your TDM and IP users?
- Do you want to add new users on an IP platform, yet preserve your existing investment in TDM equipment?
- Do you want a migration strategy that makes sense for your company?
- Do you want your IP telephony network to be as reliable as your traditional voice network?
- Do you need your IP network to be more reliable than your data network?
- Do you have multiple call centers that you want to consolidate?

Key Points

The key points of the Communication Server 2100 include:

- Business continuity – The Communication Server 2100 provides continual service for mission-critical users and applications to ensure revenue retention and improved customer satisfaction.
- Low operating expenses - The Nortel Communication Server 2100 provides simplified and consolidated management and administration that reduces the cost of additions, moves, and changes. The Communication Server 2100 is also a cost-effective solution for replacement of expensive Centrex lines.
- Large-scale convergence – The Nortel Communication Server 2100 improves employee productivity through virtual office and collaborative services. Reduced network costs and real estate are possible through node consolidation and convergence of the voice and data networks.
- Carrier-grade reliability - The “five nines” carrier reliability means product upgrades and maintenance, call path outages, equipment failures, and software errors cause less than 5.3 minutes of access downtime yearly. The Communication Server 2100 meets Telcordia (US) requirements. Redundancy in all core components, including power, processors, disk drives, and shelves, helps ensure carrier-grade reliability.
- Highly scalable, multifunctional switch - As a

multifunctional switch, the Nortel Communication Server 2100 lowers network operating expenses and complexity. This enables the enterprise to be ready to support unforeseen business needs that can occur through mergers, acquisitions, and expansions. The Communication Server 2100 delivers a consistent experience across the business and low costs and disparate technologies through consolidation.

- **Investment protection** - The Nortel Communication Server 2100 supports hybrid and pure IP networks. Organizations can upgrade at a comfortable pace from their existing Nortel Meridian SL-100 to a Nortel Communication Server 2100 or install a new Nortel Communication Server 2100 and continue to use analog and digital phones. Organizations can migrate from Centrex and keep existing phones and complete functionality to protect their investments in equipment and training.
- **Open standards** - The Nortel Communication Server 2100 was designed with open standards for ease of interoperability with other applications and services. It is highly flexible and delivers new capabilities quickly.

Typical Applications

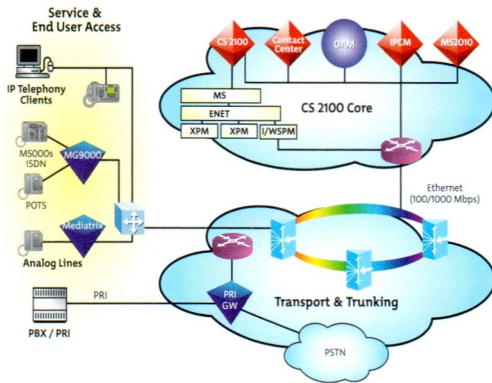
Typical applications of the Nortel Communication Server 2100 include:

- **Business continuity**: for companies where the voice network is mission critical to operations, the Nortel Communication Server 2100 provides disaster recovery and continuity of voice services. It dynamically routes calls to any point on the wide area network, runs from multiple locations, and redirects calls dynamically to other locations if a disaster or network disruption occurs. Geographic survivability allows the redundant processors of the system to be in different geographic locations so a disaster in one location does not interrupt the operation at other locations.
- **Virtual contact center**: the Nortel Communication Server 2100 can consolidate multiple call centers and collapse applications into a central data center model. A virtual contact center can use lines and trunks directly from the Nortel Communication Server 2100 or

collected from existing PBXs using CTI. The Communication Server 2100 can reduce the edge infrastructure by centralizing business logic and call control, so that the customer can use all agents and resources in the contact center as if they were part of a single PBX system.

- **Centrex migration**: the Nortel Communication Server 2100 provides investment protection and flexibility for existing Nortel Meridian SL-100 customers who have pockets of Centrex in their network or for entirely Centrex-based customers who want to move to a carrier-managed or self-managed services model. Enterprises can deploy packet gateways to bypass traditional Centrex, which reduces branch Centrex expenses while keeping analog set investment and call feature capabilities of the Centrex environment.
- **Datacenter Consolidation**: enterprises can deploy the Nortel Communication Server 2100 into an existing PBX or satellite branch office network to collapse services, applications, and intelligence into a central framework. This solution optimizes access expenses and reduces capital and operational expenses. The Nortel Communication Server 2100 centralizes and simplifies operations, administration, and maintenance and enables new IP services to be deployed ubiquitously across the network.²³⁴
- **Managed services**: partners can use the capacities, applications, carrier-grade reliability, and billing features of the Nortel Communication Server 2100 to offer various managed services for voice services, data services, call center applications, unified messaging, and multimedia services to small- to mid-sized enterprises.

Network Diagram



Features and Benefits

The features and benefits of the Nortel Communication Server 2100 include:

- Geographic survivability allows continuity of services in case of disasters such as fire, severe weather, or acts of terrorism. Enterprises can distribute their call servers between locations up to 75 miles apart. The Communication Server 2100 redirects traffic dynamically and can extend the IP-based VLAN to different locations to provide subsecond failover. In a geographic survivability configuration, the media gateways for both lines and trunks have access to either call server. Enterprises can deploy applications in a tandem configuration. The Communication Server 2100 supports IP twinning, which duplicates IP soft phones on existing stations.
- Integrated Element Management System enables centralized management and administration. Besides common provisioning for distributed networks, IP Phones support DHCP and self-labeling keys, which lowers the total cost of ownership for the network. The Communication Server 2100 ports Centrex telephone devices over Media Gateways without changing the user experience.
- Application Integration, a key element of the Enterprise Portfolio, optimizes common components and applications so that enterprises can maximize their investments in:
 - CallPilot Unified Messaging
 - Contact Center Manager Server (CCMS)
 - Ethernet Routing Switch Portfolio
 - VPN Routers
 - Media Gateways and Survivability Solutions
 - Enterprise IP Telephony
- Carrier-grade technology for the enterprise business is the same leading technology deployed by major North American and global carriers. Nortel is the vendor of choice for IP telephony technology in the carrier space where reliability and services cannot be compromised. With 99.999 percent reliability and redundancy in all core components, the Nortel Communication Server 2100 enables highly reliable solutions over IP.
 - Complete duplication of all critical elements
 - Port-level redundancy
 - Up to 2.4 million Busy Hour Call Attempts (BHCA)
 - Geographic separation and survivability
- Unmatched scalability allows enterprises to expand their networks easily and cost-effectively from 5 000 to 200 000 ports. Large

campus environments address growth easily with up to 200 000 ports.

- 125 000 IP Phones
- 200 000 IP trunks
- 99 999 ACD agents
- 112 000 nodes on one call server

- Investment protection because enterprises retain maximum investments when upgrading from the MSL-100 to a Communication Server 2100
 - XA-Core processor
 - Applications
 - Media Gateways support existing ports
- **The Communication Server 2100** has open standards Linux operating system and open industry standard hardware (compact PCI processor), and features multivendor compatibility, including H.248, SS7, QSIG, H.323, MGCP, Session Initiation Protocol (SIP), ASPEN, NCS, and UNISTim interfaces for the enterprise. The architecture promotes compatibility with standards-compliant packet-switching equipment, TDM circuit-switched facilities and operations support systems (OSS) and billing operations.
- **The Communication Server 2100** capitalizes on the portfolio power of Nortel products, embedding the reliability and performance of Nortel Ethernet Routing Switch 8600, the transport and flexibility of Nortel Optical Metro platforms, and the capacity and capability of the Nortel Multiservice Switches in the carrier data portfolio. Enterprises experience an end-to-end Nortel solution or multivendor solution based on their requirements through flexible interoperability features.
- **Multimedia collaboration** with the Nortel Multimedia Communication Server 5100 (MCS 5100) expands traditional enterprise services and offers advanced multimedia services such as productivity—enhancing collaborative capabilities and presence-enabled call handling and directory services.

Nortel Communication Server 2100 Software Release SE09

Nortel Communication Server 2100 Software

Release SE09 (SE09) offers many enhancements that are aimed at reducing the overall cost of the solution and simplifying the architecture, administration, and management. SE09 continues to build on prior releases with improvements in reliability and specifically security of the Communication Server 2100. Automatic Call Distributor (ACD) capacities continue to increase to support call center consolidation initiatives. SE09 introduces support for the Nortel WLAN Handset portfolio to improve employee productivity, specifically in vertical markets such as health care, education, and manufacturing.

Nortel incorporates the following new features and capabilities into SE09:

- **General features**
 - IP Client Manager (IPCM) call state enhancements
 - Multiple time zones (Network class of service [NCOS] and time-of-day [TOD] feature interaction)
 - T.38 fax over Session Initiation Protocol (SIP) trunk
 - Universal Signaling Point enhancement
- **Capacity enhancements**
 - Automatic Call Distributor (ACD) and ICM capacity increases
 - Border control point 7200
- **Media gateways**
 - Combine profiles on Gateway Controller (GWC)
- **IP client devices**
 - WLAN Handset 2210, 2211 and 2212
 - IP Phone 2001 user enhancements
- **Applications**
 - Redundant Intelligent Call Management (ICM) links
- **Performance enhancements**
 - Media Gateway (MG) 15000 REXtst enhancement
- **Security enhancements**
 - H.248 xUA Network Address Translation (NAT) traversal
 - Transport layer security (TLS) for Session Initiation Protocol (SIP) trunks
 - Operations Administration Maintenance (OAM) security enhancements

- Border control point 7200
- Multiservice Data Manager Standardization
- Core and Billing Manager Patching Enhancement
- IPCM Patching Enhancement
- Electronic Software Delivery support for SSPFS (Solaris)
- Synchronous Backup Enhancement
- Integrated EMS Remote Ping and Traceroute

Nortel incorporated the following new features and capabilities into SE09:

- Operations Administration Maintenance and Provisioning (OAM&P) Management
 - Integrated Element Management System (EMS) support for Media Gateway (MG) 3200
- Multiservice Data Manager (MDM) standardization
- Core and billing manager patching enhancement
- IP Client Manager patching enhancement
- Electronic Software Delivery (ESD) support for SSPFS
- Synchronized backup enhancement
- Integrated EMS remote ping and Traceroute utilities

Nortel Communication Server 2100

Processors

The Nortel Communication Server 2100 offers two core processors: Extended Architecture Core (XA-Core) and Compact. The XA-Core option provides easy migration from Meridian SL-100 systems. By adding a network interface card into the XA-Core shelf and implementing software release SE06 or later, the soft switch capabilities are enabled. Then you can quickly and easily add IP clients, line gateways, or trunks gateways to the network as required. This maximizes existing investments and provides the flexibility to continue to deliver TDM today and implement IP telephony as needed. The Compact runs on Motorola PowerPC processors using a carrier-grade Linux operating system to provide the hardware flexibility and geographic survivability.

Communication Server 2100 XA Core Platform

This platform offers the following features:

- Scalable computing power
- Load Sharing (2+1) Call Agents (versus duplicated)
- Withstands multiple processor or memory failures
- Smooth evolution to IP with all XA-Core components retained when Communication Server 2100 is enabled
- Hybrid TDM or IP support

Communication Server 2100 Compact Platform

This platform offers the following features:

- Distributed structural design to support physically separated Call Servers
- Proven third-party commercial-off-the-shelf (COTS) components
- Application of recent advances in fault-tolerant technology
- Inactive Call Agent card continually receives and transmits Ethernet messages
- Memory synchronization between active and inactive Call Agent Memory

Nortel Large Trunk Gateway Portfolio

Trunk Gateways serve as the packet interface for other TDM modes and the packet network.

They provide a platform for terminating TDM trunk facilities such as PRI. Nortel offers the following two gateways:

- Media Gateway 15000 – a large-sized PSTN Gateway that supports OC3 and DS3 interfaces; H.248 standard; NI1, NI2 Signaling; and a capacity of 24 192 DS0s per frame.
- Media Gateway 7480 – a mid-sized PSTN Gateway that supports OC3 and DS3 interfaces; H.248 standard; NI1, NI2 and CAS Signaling; and a capacity of 2016 DS0s per frame.

Nortel Media Gateway 3000 series

The Nortel Media Gateway 3000 series includes mid-sized TDM gateways (Media Gateway 3200 and Media Gateway 3500) that communicate

using the H.248 standard and support Integrated Service Digital Network (ISDN) Primary Rate Interface (PRI) signaling. The Media Gateway 3000 series ships with a standards-compliant Element Management System (EMS) that uses SNMP-based management software. Two configurations are available as follows:

- MG 3200
 - o 1–16 T1s
- MG 3500
 - o 16–96 T1s (2304 DS0s)
 - o N:1 failover of DSP boards

Nortel Large Line Gateway Portfolio

Line Gateways provide a common platform for the end user's client devices and services including plain old telephone service (POTS), digital subscriber line (DSL) digital set, Ground Start and line services, and IP clients.

Nortel IP Media Gateway 9000

The Nortel IP Media Gateway 9000 combines voice and data services into a single access gateway with a single network interface and management infrastructure. This gateway supports up to 6080 lines for POTS, M5000 and Meridian 3900 series, H.248 and RTP standards, and SNMP 2.0 protocol and supports intelligent peripheral equipment (IPE) cabinets, DSL, and ISDN.

Nortel IP Client Manager

IP Client Manager (IPCM) 9.0 uses IP technology to deliver the full Meridian business feature set and capabilities to users connected to a managed IP network in a hybrid or pure IP solution.

Third-party Analog Gateways

See Mediatrix IP Analog Gateway in the Select Products Program section of this guide for details.

Market Information

Key differentiators for the Nortel Communication Server 2100:

- Carrier-grade reliability and redundancy of all core components
- Modular scalability to 200 000 ports
- Investment protection
- Low operating costs
- Simplified and streamlined operations
- Hybrid and pure IP network support
- Geographic survivability
- Support for open standards
- Multifunction switch, a PBX with central office switching capabilities
- Uses the entire Nortel portfolio for optical, data, wireless, and applications

Technical Specifications

The technical specifications for the CS2100 are as follows:

Call Processors	XA-Core (Extended Architecture Core) Motorola 604 processor From 768 MB to 1152 MB Memory	Compact PCI MCPN765 Compact PCI card 500 MHz PowerPC 7410 processor 2 MB L2 cache 1.5 GB ECC RAM 16 MB on-board Flash memory
Busy Hour Call Attempts	Up to 2 million BHCA 100 000 simultaneous calls	Up to 104 million BHCA 100 000 simultaneous calls
Client Capacity	165 000 Clients (not including trunks)	165 000 Clients (not including trunks)
Operating System	vxWorks	Carrier Grade Linux
Geographic Survivability	Not Applicable	The processors can be up to 120 kilometers (75 miles) apart

Redundant Equipment	Processors Power Disk Drives Shelves	Processors Power Disk Drives Shelves
Telephones Supported	Analog Sets All Digital Sets M2000 series sets M3900 series sets M5000 series sets IP Sets IP Phone 2001 IP Phone 2002 IP Phone 2004 IP Phone 2007 IP Phone 1120 (SE09.1) IP Phone 1140 (SE09.1) WLAN Handset 2210 WLAN Handset 2211 WLAN Handset 2212 Soft Clients M6350 MCS Client	
Standards Supported	H.248/Megaco - Line and Trunk ISDN (NI-1 and NI-2) SNMP RTP RTCP H.323—Trunk RFC 2705 (MGCP-Media Gateway Control Protocol) Packet Cable—NCS 802.11 UNISlim RFC 3261 SIP (Session Initiation Protocol)—Trunk Application RFC 2833 Signals) SIP T.38 NEBS SS7 QSIG	
Gateways Supported	Trunk Gateways Media Gateway 7480 Media Gateway 1500, Media Gateway 3200, Media Gateway 3500 Line Gateways MG 9000 Analog/Digital Station Gateway, IP Client Manager 9.0, third-party analog gateways	
Operating Environment Power Consumption	Call Control Frame Power: 2500 watts or 8540 BTU per hour Current Drain: 56.2 Amps Nominal Voltage : -50.25 Volts Operations Administration Maintenance and Provisioning (OAM&P) Cabinet Power: 1650 watts or 5640 BTU per hour Current Drain: 32.5 Amps Nominal Voltage: -50.25 Volts SuperNode Data Manager Cabinet Power: 870 watts or 3980 BTU per hour Current Drain: 17.2 Amps Nominal Voltage: -50.25 Volts Note: Power consumptions vary depending on the actual components housed in each cabinet.	

Dimensions	C42 equipment cabinet Width: 107 cm (42 in.) Height: 183 cm (72 in.) Depth: 71 cm (28 in.) Houses: XA-Core, Message Switch, ENET C28 equipment cabinet Width: 71 cm (28 in.) Height: 183 cm (72 in.) Depth: 71 cm (28 in.) Houses: SuperNode Data Manager, Integrated Service Module/Input/Output Module PTE2000 equipment cabinet Width: 61 cm (24 in.) Height: 213 cm (84 in.) Depth: 61 cm (24 in.) Houses: SAM21 shelves with 3PC Call Agent, Network File System, Gateway Controllers, Sun Netra servers for Device Managers and OAM&P applications Note: In Communication Server 2100 Compact configurations, the main PTE2000 cabinet houses two SAM21 shelves. A second PTE2000 frame is needed to house the Element Managers for Communication Server 2100 Compact components. SAM16 shelves configured as RTP Media portal, Sun Netra servers for Device Managers and OAM&P applications.
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Ordering Information

For further information, contact your local Nortel representative.

Nortel IP Clients

Nortel IP Clients are portals to advanced applications as delivered from the network. Nortel IP Clients facilitate access to, and enhance user experience with, advanced applications, thereby boosting revenue opportunities, expanding service levels, and increasing worker productivity for the business. Nortel IP Clients support a comprehensive suite of business-grade telephony features, as delivered from Nortel Communication and Application Servers. Nortel IP Clients also expand the realm of communications that are possible from an IP Phone. Advanced applications access, leveraging high-resolution displays, standard USB port for flexible application navigation and text entry using a mouse and keyboard, Gigabit Ethernet for enhanced connectivity, and converged application-presentation capabilities as delivered from external application servers are available to customers from models within the Nortel IP Clients portfolio.

With Nortel IP Clients, solutions are available to meet the needs of every type of worker and organization. Campus-based workers and teleworkers can leverage a broad portfolio of Nortel IP desktop solutions, ranging from single-line offerings for meeting basic communication needs to multiline, multimedia applications in support of more advanced and call-intensive environments. Nortel desktop IP Phones employ thin-client (stimulus/response) architecture and capitalize on Application Servers for presentation of multimedia content such as data applications and web-centric content on IP Phones. Nortel IP Softclients and Multimedia Clients can be used by campus-based workers, teleworkers, and mobile workers to deliver anywhere, anytime, anyplace access to business-grade telephony communications. The Nortel IP Softclients and Multimedia Clients also offer unified access to a host of advanced communications capabilities. These capabilities include self-presence and presence status of colleagues, secure instant messaging, ad-hoc and meet-me audio conferencing, video conferencing, real-time file exchange, and white-boarding. Mobile workers can also take advantage of the Nortel portfolio to support their communication needs.

For customers with 802.11 Wireless LAN deployments within their campus, mobile workers can leverage Nortel Voice over Wireless LAN Handsets. Also available to mobile workers are the Nortel IP Softclients and Multimedia Clients, providing support on a variety of portable devices such as PDAs, Smartphones, and BlackBerrys. Even workers who need connectivity across the campus and external cellular network have a solution with the Nortel Dual Mode Mobile Client 3100 for WiFi/Cellular network support.

- Nortel IP Desksets
- Nortel IP Phone 2000 series
 - Nortel IP Phone 2001 (single-line, standard level)
 - Nortel IP Phone 2002 (multiline, intermediate-level)
 - Nortel IP Phone 2004 (multiline, professional-level)
 - Nortel IP Phone 2007 (multiline, color, touchscreen display, advanced level)
 - Nortel IP Audio Conference Phone 2033 (single-line, specialty application)
 - Nortel IP Phone Key Expansion Module (KEM)
- Nortel IP Phone 1100 series
 - Nortel IP Phone 1120E (multi-line, intermediate level)
 - Nortel IP Phone 1140E (multi-line, professional level)
- Nortel IP SoftClients
 - Nortel Dual Mode Mobile Client 3100 (DMM3100) (802.11 WiFi/Cellular SoftClient for Smartphones)
 - Nortel IP Softphone 2050 (PC-based SoftClient)
 - Nortel Mobile Voice Client 2050 (Pocket-PC PDA SoftClient)

- Nortel Multimedia Clients
 - Nortel Multimedia PC Client (MCS 5100)
 - Nortel Multimedia Web Client (MCS 5100)
 - Nortel Multimedia Office Client (MCS 5100)
 - Nortel Multimedia Wireless Client for BlackBerry
- Nortel Voice over Wireless LAN handsets
 - Nortel WLAN handset 2210
 - Nortel WLAN handset 2211
 - Nortel WLAN handset 2212
- Nortel IP Client Accessories
 - Nortel Enhanced USB Headset Adapter
 - Nortel Mobile USB Headset Adapter
 - Nortel WLAN Handset 2200 series Accessories

Nortel IP Desksets

Overview

Nortel Internet Protocol (IP) desksets employ thin-client (stimulus/response) architecture and capitalize on Application Servers for presentation of multimedia content such as data applications and Web-centric content on IP Phones. This enhances security versus desktop IP Phone implementations with integrated XML browsers, which must maintain open ports to access such content. Thin-client architecture reduces centralized administration costs because IT administrators can make changes on the network application server and then push the changes to each phone. With integrated XML-browser implementations, IT administrators must address changes at each and every desktop.

Nortel IP Phone 2000 Series

The Nortel IP Phone 2000 series of desksets supports a comprehensive suite of business-grade telephony features and applications and is supported with the Nortel Business Communications Manager 50/200/400, Nortel Communication Server 1000, Nortel Multimedia Communication Server 5100, Nortel Multimedia Communication Server 5200, Nortel Communication Server 2000, and Nortel Communication Server 2100.

The Nortel IP Phone 2001 is a standard-level, single-line desktop IP Phone. The Nortel IP Phone 2001 incorporates a 3-line x 24-character monochrome display and provides a cost-effective solution tailored for users with a low- to moderate level of call activity, while addressing enterprise demands for a full end-to-end IP solution.

A mid-range offering within the Nortel IP Phone 2000 series desktop portfolio, the Nortel IP Phone 2002 is a multi-line (up to four) IP Phone with a 4-line x 24-character monochrome display and an integrated 10/100 Ethernet switch for both LAN and PC ports. The PC port supports data traffic from a collocated PC. With support of a robust suite of business-grade telephony features and external application presentations in textual format, the IP Phone 2002 is well suited to both administrative personnel and knowledge workers with intermediate-level call activity needs.

The Nortel IP Phone 2004 combines the familiarity and ease of use of traditional business communications functionality with powerful capabilities that capitalize on the values introduced by converged application presentation on the desktop IP Phone. This multi-line (support for up to twelve line/feature appearances) IP Phone features a built-in 10/100 Ethernet switch (for both LAN and PC ports) designed to support data traffic from a collocated PC. The IP Phone 2004 features a large 8-line x 24-character monochrome display screen capable of presenting data or web-centric applications in textual format. The IP Phone 2004 is a professional-level deskset that is an ideal solution for managers, senior administrative personnel, and knowledge workers.

The Nortel IP Phone 2007 is a superior multimedia "information appliance" that featuring a 320 x 240 pixel-based, fully backlit color touchscreen display. The touchscreen adds intelligence and convenience as an option to the traditional telephone hard keys. The IP Phone 2007 leverages a variety of network-based applications servers to deliver advanced applications access and can use both prepackaged and customized content, such as that delivered by the Nortel Application Gateway 1000. With a business telephony feature set that builds upon the IP Phone 2004, the IP Phone

2007 is an ideal solution for customers seeking a premier multimedia user experience. With its advanced-level capabilities and the emulation of feature sets equal to that of an IP Phone 2004, the IP Phone 2007 is targeted at managers, executives, knowledge workers, and vertical applications within hospitality, retail, finance, and services-related industries such as transportation and entertainment.

The Nortel IP Audio Conference Phone 2033 is a single-line, specialty application IP Phone that delivers flexible, expandable, full-duplex handsfree speakerphone support for audio-conference communications. Offering 360-degree room coverage and support of up to two extension microphones, the IP Audio Conference Phone 2033 is well suited for small-to-medium sized offices and conference rooms 6.1 m by 9.1 m (20 ft by 30 ft) in size.

Ideal For

- **Nortel IP Phone 2001:** designed for users who require a standard level of telephony communications support, the deskset is ideal for common area deployments such as reception areas, hallways, school rooms, lobbies, cafeterias, and restaurants with lower call activity requirements.
- **Nortel IP Phone 2002:** designed for intermediate call activity environments, the deskset addresses the needs of knowledge workers, technical specialists, and administrative personnel.
- **Nortel IP Phone 2004:** designed for professional-level call activity environments that are more call intensive, the deskset is well suited for managers, executives, and senior level office administrators who seek a full suite of telephony and applications communications capabilities.
- **Nortel IP Phone 2007:** designed for an advanced level of communications for customers who wish to capitalize on its ability to present converged multimedia-rich applications, the deskset is ideal for deploying in numerous environments. Examples of deployment applications include a hotel suite that features a daily services menu, corporate lobbies or sales offices where the phone is capitalized on to present company highlights or events, retail kiosks for self-service support, knowledge workers who need to obtain information while talking to a customer (for example, inventory, student attendance, or sales promotions) and placement with executives (as a "prestige" phone).
- **Nortel IP Audio Conference Phone 2033:** designed for conference rooms and executive or

managerial offices with coverage up to 6.1 m by 9.1 m (20 ft by 30 ft) in size, the speakerphone delivers 360-degree room coverage with full-duplex, handsfree support and the administrative benefits of an IP-based solution.

Business Challenges

- Do you want flexibility and choice when it comes to desktops for your users?
- Do you have various platforms (BCM 50/200/400, Meridian 1, CS1000, CS2000, CS2100, MCS5100, or MCS5200) throughout your network?
- Do you want to enhance your employee user experience and maximize their personal productivity by delivering simultaneous access to converged (voice and data) and by enhancing user application experiences through the IP Client)?
- Do you want to optimize your IP Clients requirements for today and for the future?

Key Points

- As business needs change, you can redeploy Nortel IP Phones to other locations to minimize cost and maximize operational efficiencies.
- You can efficiently maintain IP Phones across a converged network, making the IP Phones more cost-effective to administer.
- Nortel IP Phones access and expand on the same robust suite of business-grade telephony features delivered to traditional phone sets from Nortel Communication Servers.
- Nortel IP Phones provide a flexible choice of desktop clients and standards-based powering options to address diverse enterprise needs.
- You can use Nortel IP Phones for business or IP contact-center applications.

Features and Benefits

All Nortel IP Phones connect directly to an enterprise LAN using standards-based Ethernet connections and can be powered by Power over Ethernet (802.3af compliance) or local AC power adapters. Nortel IP Phones support either manual or automatic IP address assignment with a standard DHCP server to simplify administration and reduce the cost of station moves, additions, and changes. Designed to connect seamlessly with the entire range of Nortel IP telephony system platforms, Nortel Communication servers and hybrid Nortel Meridian 1 systems support Nortel IP Phones.

- Simplicity, flexibility, and cost advantages
 - Sets are flexible and can be connected to any Ethernet LAN port.
 - IP phones are more cost-effective to redeploy and administer as part of a synergistic IP end-to-end solution.
 - Several deskset models support converged application access from external applications, such as Express Directory searches from the Nortel Application Gateway 1000. With this capability, a user can search the company corporate directory in a fraction of the time it would take with a traditional PBX-based corporate directory searches.
 - Select Nortel deskset models can display text-based business data applications. Examples include information such as price checks, inventory reports, or university class schedules.
 - IP Phone 2000 series desksets (Phase II hardware) support enhanced security with standards-based implementations of 802.1x and Extensible Authentication Protocol (EAP) for user-based authentication, Signaling Encryption by Authenticated Encryption Standard (AES) 128-bit, and Media Encryption by Secure Real-time Protocol (SRTP) pre-shared key.
- Portability
 - Nortel IP Clients can be extended to virtually anywhere in the LAN/WAN using IP.
 - Home workers can be connected securely over either public broadband or dialup services from anywhere in the world.
 - Branch offices can be connected back to a central hybrid Nortel Meridian 1, Nortel Meridian SL-100, Nortel Communication Server 1000, Nortel Communication Server 2100, or one of the Nortel Business Communications Manager platforms using a Nortel data switch at the branch office and data network connection back to the central site.
 - Users can enter a code into an IP set to access their own profiles from that set anywhere in the corporate network.
- Unified infrastructure
 - With the Nortel IP Phone 2002, 2004, and 2007, users can connect the phone and the PC to the LAN through a single Ethernet cable from the wiring closet to the desktop. Doing so reduces overall cabling costs, delivering a unified infrastructure that supports both advanced voice and data applications.
 - Nortel offers comprehensive power support for Nortel IP Phones, including IEEE 802.3af standard powering schemes that boost reliability and reduce costs with centralized power backup and local power-adaptor options.
- Improved productivity
 - Multimedia capabilities of the IP Phone 2002, 2004, and 2007 provide new avenues for information exchange and productivity applications such as Visual Voicemail, Broadcast Alerts, and Zone Paging and Express Directory searches of corporate directories.
 - Familiar user interface and telephony features across the entire IP Phone portfolio reduce employee training costs.
 - Features such as Multiple Appearance Directory Number (MADN) or SIMRING enable employees to “twin” multiple IP phones off their main office IP phones, extending the reach of the corporate network and delivering anywhere and anytime access to employees.

Nortel IP Phone 2001

- single-line deskset with 3-line x 24-character monochrome LCD
- four context-sensitive soft keys, five fixed keys, and two feature keys, (Services/Messages) and up/down navigation
- visual incoming-call alerter and message-waiting-indicator light
- headset support using third-party headset adapters
- listen-only speaker supports of on-hook dialing and inbound audio pages and alerts
- support for local ac power adapter or direct power from 802.3af compliant switches at the wiring closet.



Available desk- or wall-mounting options:

- ADA-adjustable LCD contrast
- user-selectable ringtones
- American Disabilities Act (Sec. 508)–compliant
- support for 802.1x and Extensible Authentication Protocol (MD-5), Signaling Encryption (Authenticated Encryption Standard 128-bit), and Media Encryption via Secure Real-time Protocol (SRTP) pre-shared key
- support for 802.1ab Link Layer Discovery Protocol (LLDP) for ease of discovery and simplified administration

Nortel IP Phone 2002

- multi-line set with 4-line x 24-character monochrome LCD
- support for four self-labeling user-defined features, line keys, and four context-sensitive soft-label keys
- support for advanced application access with textual presentation as delivered by External Application Servers (XAS), such as the Nortel Application Gateway 1000.
- visual incoming call alerter and message waiting-indicator-light
- integrated headset port support for direct amplified and un-amplified headset connection (built-in headset amplifier)
- four-way navigation cluster keys for fast menu, sub-list, and call-log scrolling
- high quality audio speakerphone and headset option for superior handsfree communications
- support for local ac power adapter or power from 802.3af-compliant switches at the wiring closet
- integrated IEEE 802.3 10/100 Ethernet Switch with LAN and PC ports
- adjustable LCD contrast
- user-selectable ringtones
- desk- or wall-mounting options.
- American Disabilities Act (Sec. 508)-compliant.
- support for 802.1x and Extensible Authentication Protocol (MD-5), Signaling Encryption (Authenticated Encryption Standard 128-bit), and Media Encryption by Secure Real-time Protocol (SRTP) pre-shared key
- support for 802.1ab Link Layer Discovery Protocol (LLDP) for ease-of-discovery and simplified administration



Nortel IP Phone 2004

- multi-line set with 8-line x 24-character monochrome LCD
- support for 6 self-labeling programmable user-defined features and line keys (12 on Nortel Communication Servers supporting shift), and 4 context-sensitive soft label keys
- support for advanced application access with textual presentation as delivered from External Application Servers (XAS), such as the Nortel Application Gateway 1000
- visual incoming, call alerter and message-waiting-indicator light
- integrated headset port support for direct amplified and un-amplified headset connection (built in headset amplifier)
- navigation cluster keys for fast menu, sub-list, and call-log scrolling
- high-quality audio speakerphone and headset option for superior handsfree user experience
- adjustable LCD contrast
- support for local ac power adapter or direct power from 802.3af-compliant switches at the wiring closet
- integrated IEEE 802.3 10/100 Ethernet Switch with LAN and PC ports



User selectable ringtones

- desk- or wall-mounting options
- American Disabilities Act (Sec. 508)-compliant
- support for 802.1x and Extensible Authentication Protocol (MD-5), Signaling Encryption (Authenticated Encryption Standard 128-bit), and Media Encryption using Secure Real-time Protocol (SRTP) pre-shared key
- support for 802.1ab Link Layer Discovery Protocol (LLDP) for ease-of- discovery and simplified administration.

Nortel IP Phone 2007

- multiline set with 320 x 240 pixel, QVGA, color touch screen LCD
- support for 6 self-labeling programmable user-defined features or line keys (12 on Nortel Communication Servers supporting shift)
- built-in touch screen with customized stylus as standard to enhance user experience and flexibility beyond a traditional telephone interface
- support for prepackaged and Web-centric applications in graphical form as offered by External Application Servers, such as the Nortel Application Gateway 1000.
- support for standard USB mouse, keyboards, and powered hubs for flexible point-and-click access and navigation of applications and telephony menus
- secured Local Tools Menu support for USB and navigation cluster administrative access to user preference options, configuration menus, diagnostics tools, and local or network statistics capture
- support for local ac power adapter or direct powering from 802.3af-compliant switches in the wiring closet
- visual incoming-call alerter and message-waiting-indicator light
- integrated headset port support for direct amplified and un-amplified headset connection (built in



- headset amplifier)
- user-selectable ringtones
- adjustable LCD brightness and contrast
- personalized softkeys
- desk- or wall-mounting
- American Disabilities Act (Sec. 508)-compliant
- support for 802.1x and Extensible Authentication Protocol (MD-5), Signaling Encryption (Authenticated Encryption Standard 128-bit), and Media Encryption with Secure Real-time Protocol (SRTP) pre-shared key
- support for 802.1ab Link Layer Discovery Protocol (LLDP), for ease of discovery and simplified administration
- integrated IEEE 802.3 10/100 Ethernet Switch with LAN and PC ports

Nortel IP Audio Conference Phone 2033



- single-line with comparable business telephony features of the IP Phone 2001
- backlit 3-line x 24-character monochrome LCD for enhanced viewing angles
- full-duplex handsfree (IEEE 1329-compliant)
- 360 degree room coverage with two extension microphones for support of small-to-medium offices and conference rooms up to 6.1 m by 9.1 m (20 ft by 30 ft)
- intelligent and synchronized status indicator with 3 LEDs viewable from varying angles within the room
- three feature softkeys
- high-quality audio-comfort noise generation, silence suppression
- Power Interface Module (PIM) support for local power or 802.3af Power over Ethernet options
- automatic IP address assignment with DHCP

Nortel IP Phone Key Expansion Module



The Nortel IP Phone 2000 series Key Expansion Module (KEM) is a hardware component that connects to the IP Phone 2002 and IP Phone 2004 to provide additional line appearances and feature keys. It offers a greater level of personalization to inbound calling customers and colleagues, offering centralized access to additional soft-labeled line and feature keys at the desktop.

- The Nortel IP Phone 2000 series Key Expansion Module is for centralized answering positions that have small-to-moderate line appearances. The IP KEM is a cost-effective, space-saving alternative to deploying multiple phones.
- The IP Phone 2000 series KEM delivers 48 additional programmable line and feature keys for 2002 and 2004 IP Phones.
- Connection is simple using an Accessory Expansion Module port on the Nortel IP Phone.
- The IP Phone KEM Key Expansion Module supports the same language set as the Nortel IP Phones.
- Each KEM has 12 physical keys on each side of an LCD display unit to provide 24 additional self-labeled line/feature keys.
- Up to two IP Phone KEMs can be attached to the same IP Phone 2002 or 2004 to provide 48 additional keys.

- The shift key functionality on an IP Phone 2004 can have up to 48 logical line and feature keys using one IP KEM.
- Feature keys on the IP Phone KEM are soft-labeled and support up to 10 characters per row.
- The KEM comes with its own stand and tilt mechanism so it can be adjusted to match the angle of the IP Phone 2004.
- Contrast adjustments are made concurrently when the user adjusts the IP Phone contrast.
- Wall-mount or desk-mount brackets are available.

Technical Specifications

	Nortel IP Phone 2001	Nortel IP Phone 2002	Nortel IP Phone 2004	Nortel IP Phone 2007	Nortel IP Audio Conference Phone 2033	Nortel IP Phone Key Expansion Module (KEM)
Power supply	100/240 V ac Power Adapter delivering 48 V dc at 520 mA				Universal Power over Ethernet Module Supporting local power 110/240 V ac; Japan 100 V delivering 19 V dc @1A	—
AC input power	90-260 V ac, 50/60 Hz				100-240 V ac; Japan 100 V, 50/60 Hz	—
DC input power	-48 V dc @ 520 mA				—	—
AC output power	N/A				19 V at 1A	—
Dimensions	on footstand	on footstand	on footstand	on footstand	N/A	measured without footstand
Width	19.1 cm (7.52 in.)	23 cm (9 in.)	28.6 cm (11.26 in.)	29.5 cm (11.61 in.)	31.1 cm (12.25 in.)	13.5 cm (5.25 in.)
Depth	17.1 cm (6.73 in.)	17.2 cm (6.77 in.)	17.2 cm (6.77 in.)	17.2 cm (6.77 in.)	6.4 cm (2.5 in.)	4 cm (1.5 in.)
Height	16.9 cm (6.65 in.)	16.7 cm (6.57 in.)	16.7 cm (6.57 in.)	17 cm (6.7 in.)	36.8 cm (14.5 in.)	15.3 cm (6 in.)
Weight	780 g (1.72 lb)	840 g (1.84 lb)	965 g (2.13 lb)	1.75 kg (3.0 lb)	880 g (1.75 lb)	—

Platform Compatibility	BCM 50/200/400, Nortel Meridian 1 PBX portfolio and Nortel Meridian SL-100, Nortel CS 1000 series, Nortel CS 2100, MCS 5100	BCM 50/200/400, Nortel Meridian 1 PBX portfolio and Nortel Meridian SL-100 systems, Nortel CS 1000 series, Nortel CS 2100, Nortel CS 2000, Nortel MCS 5100, Nortel MCS 5200	BCM 50/200/400, Nortel Meridian 1 PBX portfolio and Nortel Meridian SL-100 systems, Nortel CS 1000 series, Nortel CS 2100, Nortel CS 2000, Nortel MCS 5100, Nortel MCS 5200	BCM 200/400, Nortel Meridian 1 PBX portfolio Nortel CS 1000 series, and Nortel CS 2100, Nortel CS 2000, Nortel MCS 5100, Nortel MCS 5200	Succession 1000 Meridian 1 PBX portfolio, Nortel CS1000 series and Nortel CS2100	Nortel CS1000 release 4.0 and later (requires IP line 4.0 functionality or later) and CS2100 release SE07, IP phones 2004 and 2002 (firmware update to version B63 needed for pre-phase 2 phones)
Power dissipation	3.2 Watts idle, 4.2 Watts max, IEEE Class 2	3.2 Watts idle, 4.8 Watts Max, IEEE Class 2	3.2 Watts idle, 4.8 Watts max, IEEE Class 2	8 Watts typical, 13 Watts Max, IEEE Class 3	8.5 Watts typical, 10.5 Watts max; IEEE Class 3	—

	Nortel IP Phone 2001	Nortel IP Phone 2002	Nortel IP Phone 2004	Nortel IP Phone 2007	Nortel IP Audio Conference Phone 2033
Operating Temperature	5°C to 40°C (40°F to 104°F)				0°C to 40°C (32°F to 104°F)
Relative humidity	5% to 95% (noncondensing)				20% – 85% (non condensing)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)				-30° to 55°C (-22° to 131°F)
Codecs support	G.711a and/or u law, G.723.1 and G.729a and Annex B				G.711a and/or u law and G.729a
Call control protocol	UNISlim subset over UDP w/ reliability layer				
Headset support	Supports 3 rd party headset adapters	Built-in amplifier for direct headset connection – 3 rd party headsets supported			N/A
OS comp- atibility	N/A				
Security	Signaling – AES 128-bit; Media – Secure RTP (pre-shared key); Authentication: 802.1x and EAP (MD-5)				N/A
Audio interface	N/A				
RX jitter buffer	Configurable, default is two frames				Non-configurable

WAV buffer	N/A			
Internet telephone switch	No	Integrated 10/100 with LAN and PC ports		N/A
Mounting	Desktop or wall-mount			Desktop
Ports	1 internal	3 (1 internal, 2 external)	3 (1 internal, 2 external)	3 (1 internal, 2 external) , USB (100mA power output; 500 mA power output w/ USB hub)
Data rates	10/100 Mbps autosensing			
Standards	IEEE 802.3af PoE, 802.1p/q, 802.1X/EAP, AES-128 bit, SRTP (pre-shared key), 802.1ab (LLDP); TIA-810A (phone + Nortel handset)			IEEE 802.3af PoE, IEEE 1329; TIA-810A
MAC address	Autolearning, autoaging at 700 seconds			N/A
Hardware priority	Fixed priority to phone port based on hardware			N/A
Power feed	16V ac by supplied ac adaptor or 48 V dc Power over LAN Hub			110/240 V ac Universal Power over Ethernet Module
Load sensing	N/A			
Fault sensing	N/A			

Ordering Information

For further information, contact your local Nortel Networks representative.

Nortel IP Phone 1100 Series

The Nortel IP Phone 1100 series is an exciting new generation of desktop IP Clients that delivers a premier user experience with quick access to advanced applications. The Nortel Phone 1100 series expands the realm of communications available from a desktop IP Phone, boosting both worker and business productivity.

The IP Phone 1100 series encompasses a number of leading-edge capabilities, including support for high-resolution, pixel-based, fully-backlit, graphical grayscale displays, support for standard USB peripherals, Gigabit Ethernet speeds within the phones to support collocated PC traffic and reduced infrastructure costs, a local and secure tools menu for simplified administration, a sleek, cutting-edge ergonomic design that builds upon the Nortel standard for ease-of-use, reliability, and robustness.

Overview

The IP Phone 1120E with Gigabit Ethernet unveils an array of innovative communication features and capabilities with an intermediate-level IP Phone. The multi-line IP Phone 1120E supports four user-defined feature and line keys with a graphical presentation of data and web-centric applications on its 240 x 80 pixel, high-resolution graphical, backlit grayscale display. Application navigation is flexible, with the use of standard USB mouse devices, keyboards, and powered hubs as supported from the integrated USB port of the phone. This IP Phone 1120E integrates with the suite of features as delivered from Nortel Communication Servers.

The IP Phone 1140E with Gigabit Ethernet brings a new dimension in communication features and capabilities to the professional desktop IP Phone. The multi-line IP Phone 1140E supports up to 12 user-defined feature or line keys (with Nortel Communication Servers supporting the shift function) with a graphical presentation of data and web-centric applications on its 240 x 160 pixel, high-resolution, graphical, backlit grayscale display. An integrated USB port streamlines applications navigation with the support of standard USB mouse devices, keyboards, and powered hubs. The IP Phone 1140E also delivers workspace mobility as it supports standard **Bluetooth** headset profiles from its integrated version 1.2 Bluetooth Gateway. IP Phone 1140E integrates with the suite of features as delivered from Nortel Communication Servers.

Ideal For

- The Nortel IP Phone 1120E is designed for knowledge workers and administrative personnel. The four-line Nortel IP Phone 1120E supports graphical presentation of data and web-centric applications on its pixel-based, high-resolution graphical backlit grayscale display. Support of standard USB mouse devices and keyboards provides flexible application navigation and enhanced user experience.
- The Nortel IP Phone 1140E is designed for managers, knowledge workers, and senior administrative personnel. The multi-line (up to 12 lines with shift function) Nortel IP Phone 1140E supports graphical presentation of data and web-centric applications on its pixel-based, high-resolution graphical backlit grayscale display, while an integrated USB port

streamlines applications navigation for an enhanced user experience with support of standard USB mouse devices and keyboards. The IP Phone 1140E extends worker freedom at the desktop with integrated support of **Bluetooth** wireless technology from its integrated version 1.2 Bluetooth Gateway. Support of Gigabit Ethernet on the IP Phone 1140E integrated switch offers customers future-safe investment protection for switching of collocated PC traffic through the IP Phone.

Business Challenges

- Do you want to provide an intelligent and seamless application experience that expands your employees' communication capabilities and personal productivity?
- Do you want a next-generation IP Phone that delivers the features and the physical design that have a direct and positive impact on the

quality of user experience?

- Do you want a desktop IP Phone that provides advanced capabilities, including support for data and web-centric applications, while prioritizing telephony functionality first for Quality of Service and Experience?
- Are you concerned over ensuring that your business communications are secure?

Key Points

- The Nortel IP Phone 1100 series ergonomic design that affords greater space savings at the desktop where space is at a premium.
- The high-resolution, pixel-based, graphical 8-level grayscale displays enhance user experience with crisp character and graphical presentation whether engaged in telephony or data applications.
- The IP Phones 1100 series is designed from the ground up to deliver IP Services with advanced applications capabilities, such as Gigabit Ethernet support, high-resolution pixel-based graphical displays, five-way navigation cluster, and USB device support for superior navigation. The IP Phone 1140E provides greater freedom at the desktop with integrated **Bluetooth** wireless technology for headset support.
- The IP Phone 1100 series is Session Initiation Protocol (SIP)-ready and is positioned to support standards-based RFC 3261-compliant SIP firmware upon its availability to the phones.
- The IP Phone 1100 series supports standards-based security implementations for user authentications (802.1x/EAP), Signaling Encryption (AES-128bit), and Media Encryption (SRTP).
- combination with the high-resolution, graphical, eight-level grayscale display, provides superior viewing experience for users under varied lighting conditions.
- Sets support standard USB mouse devices or keyboards that allow third-party devices emulating USB keyboards along with powered hubs, which deliver more intuitive navigation of telephony, data, and Web-centric applications.
- The IP Phone 1100 series is SIP-ready and is positioned to support unified communications capabilities such as presence and instant messaging upon firmware availability of SIP firmware for the phone.
- Improved Productivity
 - An integrated Bluetooth 1.2-compliant Audio Gateway (Headset Profile, Bluetooth Power Class 2), comes standard on the IP Phone 1140E to deliver support for headsets that feature Bluetooth wireless technology to extend freedom at the desktop.
 - Visual Alerting Message Waiting/Incoming Call and Data Messaging Feature Status indicator LEDs provide easy recognition of messages, incoming calls, and firmware downloads that are in progress to the phone.
 - Icon and English-text based keycaps address customer preferences in keycap appearance for global deployment.
- Reduced Costs and Simplified Administration
 - A secure Local Tools Menu delivers access to user preferences, configuration tools, diagnostics, and network statistics to simplify administration.
 - Integrated Autosensing Ethernet 10/100/1000 Base-T switches with shared PC access consolidate cable infrastructures to minimize costs.
 - Field-upgradeable firmware using Trivial File Transfer Protocol (TFTP) or UNiStim File Transfer Protocol (UFTP) adds

Features and Benefits

The IP Phone 1100 series introduces the intermediate-level IP Phone 1120E and the professional-level IP Phone 1140E. These two models support a wide range of communications requirements with delivery of an application-rich experience.

- Rich User Experience
 - The five-position adjustable tilt-stand, in

convenience and reduces administration costs.

- The IP Phone 1100 series supports standards-based implementations of user authentication (802.1x/EAP), Signaling Encryption (AES 128-bit), and Media Encryption (SRTP).

- The IP Phone 1100 series supports Link Layer Discovery Protocol (802.1ab) for sharing of device-level information between IP Phones, switches, and routers to ease inventory management and network debugging.

Nortel IP Phone 1120E

- Multi-line IP Phone supports 4 line and programmable feature keys, 14 fixed keys, and 4 soft-label keys.
- High-resolution, backlit, graphical, pixel-based eight-level grayscale display, combined with a flexible five-position adjustable footstand placement, optimizes viewing angles under varied lighting conditions.
- Four-way navigation cluster with new Send/Enter key maximizes flexibility in navigation and delivers an intuitive user experience.
- Integrated USB port powers standard USB mouse devices, keyboards (and third-party device-emulating USB keyboards), along with powered hubs.
- Supports 802.3af standard-based Power over Ethernet (PoE) and local ac power through a power adapter.
- Secured Local Tools Menu supports USB and navigation cluster administrative access to user preference options, configuration menus, diagnostics tools, and local or network statistics capture.
- Has desk- or wall-mount options.
- Has user-selectable ringtones.
- American Disabilities Act (Sec. 508)-compliant.
 - Field upgradeable firmware using Trivial File Transfer Protocol (TFTP) or UNISTim File Transfer Protocol (UFTP) adds convenience, and reduces administration costs.
 - IP Phone 1120E supports standards-based implementations of user authentication (802.1x/EAP), Signaling Encryption (AES 128-bit), and Media Encryption (SRTP).
- The IP Phone 1140E supports Link Layer Discovery Protocol (802.1ab) for sharing of device-level information between IP Phones, switches, and routers, to ease inventory management and network debugging.



Nortel IP Phone 1140E

- High-resolution, backlit, graphical, pixel-based eight-level grayscale display, combined with a flexible five-position adjustable footstand placement optimizes viewing angles under varied lighting conditions.
- Four-way navigation cluster with new Send/Enter key maximizes flexibility in navigation, and delivers an intuitive user experience.
- Integrated USB port powers standard USB mouse devices, keyboards (and third-party device-emulating USB keyboards), and powered hubs.
- Integrated wireless headset support, combined with Bluetooth 1.2 audio gateway, supports compliant Audio Gateway (Headset Profile, Bluetooth Power Class 2) enhanced mobility at the desktop.
- Supports 802.3af standard-based PoE and local ac power through a power adapter.
- Secured Local Tools Menu supports USB and navigation-cluster administrative access to user preference options, configuration menus, diagnostics tools, and local or network statistics capture.
- Has desk- or wall-mount options.



- Has user-selectable ringtones.
- American Disabilities Act (Sec. 508)-compliant.
- Field-upgradeable firmware via Trivial File Transfer Protocol (TFTP) or UNISTim File Transfer Protocol (UFTP) adds convenience and reduces administrative costs.
- The IP Phone 1140E supports Link Layer Discovery Protocol (802.1ab) for sharing of device-level information between IP Phones, switches, and routers, to ease inventory management and network debugging.

Technical Specifications

	Nortel IP Phone 1120E	Nortel IP Phone 1140E
Platform Compatibility	Nortel CS 1000 Release. 3.0 and later; Media Gateway 1000B Expansion Chassis; Nortel CS 2100 SE09FF and later; BCM 200/400 Release 4.0 and later	Nortel CS 1000 Release. 3.0 and later; Media Gateway 1000B Expansion Chassis; Nortel CS 2100 SE09FF and later; BCM 200/400 Release 4.0 and later
Display	High-resolution, graphical, monochrome 8-level grayscale LCD, 240 x 80 pixel, fully bitmapped, backlit screen	High-resolution, graphical, monochrome 8 level- grayscale LCD, 240 x 160 pixel, fully bitmapped, backlit screen
AC power	90-260 V ac; 50/60 Hz	90/260 V ac; 50/60 Hz
DC input power	-48 V dc @ 0.52 A max 520 mA	-48 V dc @ 0.52 A max 520 mA
Dimensions	Width: 20 cm (7.87 in.) Depth: 18.8 cm (7.4 in.) Height: 20.7 cm (8.15 in.) 5560 degree footstand desktop configuration	Width: 20 cm (7.87 in.) Depth: 18.8 cm (7.4 in.) Height: 20.7 cm (8.15 in.) 5560 degree footstand desktop configuration
Power dissipation	Gbit Ethernet: 8 Watts idle, 10.5 Watts maximum 100 MB/s; 6 Watts idle, 8 Watts maximum IEEE Class 3	Gbit Ethernet: 8 Watts idle, 10.5 Watts maximum 100 MB/s; 6 Watts idle, 8 Watts maximum IEEE Class 3
Operating Temperature	5°C to 40°C (40°F to 104°F)	5°C to 40°C (40°F to 104°F)
Relative humidity	5% to 95% (noncondensing)	5% to 95% (noncondensing)
Storage Temperature	-40°C to 70°C (-40°F to 158°F)	-40°C to 70°C (-40°F to 158°F)
Protocols	E.164 dialing; Session Initiation Protocol (SIP) ready; Authentication: 802.1x and EAP (MD-5); Signaling Encryption (AES- 128bit); Media Encryption (SRTP – pre shared key); 802.1ab Link Layer Discovery Protocol (LLDP); 802.3af PoE	E.164 dialing; Session Initiation Protocol (SIP) ready; Authentication: 802.1x and EAP (MD-5); Signaling Encryption (AES – 128bit); Media Encryption (SRTP pre-shared key); 802.1ab Link Layer Discovery Protocol (LLDP); 802.3af PoE
Codecs support	G.711 a-law and/or u law, G.729a and Annex B	G.711 a-law and/or u law, G.729a and Annex B
Quality of Service	802.1 p/q, DiffServ and VLAN tagging of both telephony and PC port traffic	802.1 p/q, DiffServ and VLAN tagging of both telephony and PC port traffic
Mounting	Desktop or wall	Desktop or wall

Ports	LAN, PC, and Integrated USB port	LAN, PC, and Integrated USB port
Data rates	Integrated 10/100/1000 Base-T autosensing Ethernet switch	Integrated 10/100/1000 Base-T autosensing Ethernet switch
Standards	E.164 dialing; IEEE 802.3af, Power over Ethernet; Authentication: 802.1x and EAP (MD-5); Signaling Encryption (AES- 128bit); Media Encryption (SRTP – pre shared key); 802.1ab Link Layer Discovery Protocol (LLDP); TIA-810A (phone + Nortel handset)	E.164 dialing; IEEE 802.3af, Power over Ethernet; Authentication: 802.1x and EAP (MD-5); Signaling Encryption (AES- 128bit); Media Encryption (SRTP – pre shared key); 802.1ab Link Layer Discovery Protocol (LLDP); TIA-810A (phone + Nortel handset), Bluetooth® 1.2 compliant Audio Gateway (Headset Profile, Bluetooth Power Class 2)

Nortel SoftClients

Overview

Nortel SoftClients enable remote workers to access IP Telephony services from their networks while retaining business-grade telephony features and reliability.

Nortel SoftClients empower campus-mobile, full-and part-time telecommuters, and IP Contact Center agents to access their network for voice-communication services regardless of their physical location.

With the IP Softphone 2050, users can plug a Windows OS-based tablet or laptop PC into a network port at a shared office location. Or, use a public broadband service connection to connect a USB headset on the PC USB port for optimal voice call quality, and to work with access to the telephony features, they have access as if they were at their own desk.

The Nortel Mobile Voice Client 2050 (MVC 2050) offers the full suite of Nortel business-grade telephony features optimized for delivery on many Dell, HP and Pocket-PC PDAs equipped with IEEE 802.11 WiFi radios.

The Dual Mode Mobile Client 3100 (DMM 3100) offers mobile workers a common SIP interface and other popular PDA conveniences of a single device to address both workplace voice communications, using the WiFi network, and wide area communications using the cellular network. DMM 3100 is supported on Windows Mobile-based Pocket PC devices as well as Nortel wireless phones with integrated dual physical radio interfaces (WLAN/WWAN).

Ideal For

- Businesses with campus-mobile, part- and full-time telecommuters, and road warriors wishing to stay connected with access to their voice communications regardless of location.
- IP Contact Center agents who desire a single interface (their PC) to support converged (voice and data) communications.
- IT departments wishing to extend the reach of their networks, to enhance service levels, and boost employee productivity by configuring Nortel SoftClients as multiple appearances for employees with desktop IP Phones.
- Businesses that want to expand the reach of their network and to reduce their operating expenditure costs by bringing the voice-communications support for telecommuters and road warriors in-house.
- Customers who wish to capitalize on their investment in IEEE 802.11 WiFi networks to extend telephony services to their mobile workers.

Business Challenges

- Do you have work groups that are not colocated?
- Is scalability important to your business?
- Do your employees spend long hours on the phone and would benefit from the value of handsfree and computer telephony integration?
- Is the number of employees you have who work from home (part- or full-time) or travel on business on the rise?
- Are your users requesting a single device to support voice communications internal or external to your network?
- Do you want to extend your network's reach to enhance service levels of your business?
- Do you have employees who prefer a single device which supports converged (voice and data) communications access?
- Do you have employees seeking a common interface and device that supports both their campus- and public-network voice-communications?
- Do you have campus-based workers, casual



telecommuters, or other employees who could benefit from mobility?

- Do you want a simple, cost-effective way to provide employees who are on the go with convenient access to both their voice and data applications?

Typical Applications

- Mobile employees who share office locations and require the functionality of all the phone features available from the office.
- Office-mobile, casual, full-time telecommuters, IP Contact Center agents, and road warriors who prefer the convenience of a single device for access to both voice and data communications.
- IP Contact Centers that need to expand their geographical service areas, retain key employees regardless of location, and whose agents prefer minimal desktop presence in support of their voice communications.
- Road warriors, knowledge workers, workers in services, and industrial environments who require the portability and convenience of a single device (PDA, Smartphones) to support both their voice and data-communications running over IEEE 802.11 WiFi networks.

Key Points

Nortel IP SoftClients deliver flexibility as users provisioned with desktop IP Phones and IP SoftClients have choices in their voice communications based on their tasks.

- Nortel offers choice in IP SoftClient and SIP-based solutions to meet the varying needs of the business and its workers.
- Nortel IP SoftClients deliver a superior user experience with integration of features as delivered from Nortel Communication and Application Servers.
- Nortel IP SoftClients deliver flexibility and can act as the user's primary phone or secondary phone, whether campus-based, telecommuting, or traveling on-the-road.
- The IP Softphone 2050 emulates the operation of the Nortel IP Phone 2004, delivering access to the wide range of Nortel Communication Server telephony features with total transparency whether workers are campus-based, home-based or constantly on the go.

Features and Benefits

- Eliminate the need for traditional voice line, using a single Internet connection for both voice and data connection.
- Built on Windows-based platforms with a robust telephony application.
- Centralizes business applications at the desktop PC, tablet, or Pocket PC portable device.
- Boosts personal productivity with access to rich suite of telephony features as supported by Nortel Communication and Application Servers.
- Provides one-click direct dialing from various Windows and applications, immediate answers to user questions through online help, and superior audio performance through advanced technology and standards.
- Appeals to a broad landscape of user environments due to multiple audio interfaces.

Nortel Dual Mode Mobile Client 3100 (DMM 3100) and the Nortel Dual Mode Client 3100 with VPN Software



The Nortel Dual Mode Mobile Client 3100 (DMM3100) and the optional Nortel Dual Mode Mobile Client 3100 with VPN (DMM VPN 3100) software are standards-based SIP voice clients that are optimized VPN client software for Windows Mobile 2003 Pocket PC devices with integrated WiFi and cellular radios. The DMM 3100 with Virtual Private Network (VPN) software provides users with secure access through a VPN or IPSec connection to the enterprise's voice service over WLAN within the corporate network. Communications are secured using the IPSec standard. The DMM 3100 and DMM VPN Software with its initial release (Release 1.3) allow users to:

- View Call Status (see Icon call status).
- Make and receive calls (Active LED/Release).
- Place calls on hold.
- Support context-sensitive soft keys (call-state-dependent) including:
 - Transfer calls (SIP only)
 - Call Waiting (Answer/Reject)
 - Do Not Disturb
 - Silence (Incoming Calls)
 - Number/Address entry edits (Backspace, Clear)
- Call mute/un-mute.
- Call Volume Control.
- Keypad Dialing with Dual-Tone Multi-Frequency (DTMF) support.
- Support caller's list (incoming call log) and redial list (outbound call log).
- Access to WiFi and Cellular service voice mail.
- Cellular support over GSM/CDMA networks.
- Ability to toggle between calls.
- Unified call logs.
- Manage personal directories.
- Make WLAN (SIP) and WWAN (cellular) calls simultaneously.

The Nortel Dual Mode Mobile Client is supported on Nortel Wireless LAN 2230/2270 and 2300 series Access Points along with third party IEEE 802.11 WiFi Access Points.

Key Points

- Simplified experience with a common device or interface.
- Integrated suite of applications such as WiFi, cellular, and diagnostics.
- Accessible key telephony features.
- Capitalizes on enterprise investment in WiFi networks.
- Independent of cellular network type for flexible and fast deployment.
- Improves mobility, responsiveness and productivity.
- Superior voice quality on converged wireless networks.
- Simplifies training requirements.

Technical Specifications (DMM 3100 Release 1.3)

Solution Component	Minimum Requirements / Version
Dual-Mode PocketPC Device	Hardware Specifications (Recommendations): Device: Pocket PC with Microsoft Windows Mobile 2003 SE (4.x) – English Text Only Processor: TI OMAP1510 200MHz or higher / Intel PXA 400 MHz or higher (Intel Xscale 520MHz recommended) Memory (RAM/ROM): 64 MB RAM / 64 MB ROM (128 MB RAM / 128 MB ROM recommended) Connectivity: Integrated cell radio and integrated WiFi radio (note: Cellular provider must support the respective Pocket PC) Display: QVGA (240 x 320) or higher color display (application supported in portrait mode only).
Wireless LAN Infrastructure	Wi-Fi Compliant IEEE 802.11 WLAN infrastructures Nortel Wireless LAN 2300 series Recommended WLAN 2330 Access Point (Rls 4.0.20.0 or later) WLAN Security Switch 2350/2360/2380 (Rls 4.0.20.0 or later.)
VPN Routers/Gateways (Optional)	The DMM 3100 client with VPN can work with several industry-leading VPN routers/gateways. Use of Nortel's VPN Router Portfolio is recommended for optimum performance: Nortel VPN Router requires Rls 6.00_151+patch or later.
Communication Server	Nortel Multimedia Communication Server 5100 Rls 3.5 or later.

Nortel IP Softphone 2050



The Nortel IP Softphone 2050 transforms a user's Windows-based desktop or laptop PC into a fully featured communications platform by adding feature-rich, high-quality, voice communications to the inherent data-communications capabilities of the PC. The IP Softphone 2050 can be used by campus workers, telecommuters, IP Contact Center agents, and road warriors as a primary or supplemental desktop telephone. Users simply load the software and plug a Nortel-approved headset or handset into the USB Audio Adapter port to start communicating. Business-grade telephony features comparable to that of the professional-level IP Phone 2004 set are delivered.

Features and Benefits

- Supports up to 12 programmable line or feature keys (for Nortel Communication Servers that support the shift function) and 4 interactive soft keys.
- Enhanced USB Audio Kit and Mobile USB Headset Adapter provide a telephony-optimized sound card and include Global IP Sound (GIPS) packet-loss equalization software for superior audio performance.
- Features such as call origination, call termination, mute, volume, and message waiting indication are accessible through the IP Softphone 2050 and the USB audio adapter.
- Fixed keys include copy, quit, up, down, right, and left navigation keys; mute, up, and down volume keys; answer, goodbye, information key, directory, inbox, outbox services, quick dials, redial list, callers list, and local directory.
- User-selectable slide-out feature trays (line/feature keys, dialpad, or a combination).
- Supports visually-impaired workers using third-party screen reading software from Freedom Scientific (JAWS).
- Support for personal call recording (third-party solution from Algo Solutions, Inc.).
- New enhanced and compact themes for quick and efficient access to IP Softphone 2050 features.
- Supports local directory imports from LDAP-supported directories such as Microsoft Outlook.
- Supports static VPN and Dynamic Host Configuration Protocol (DHCP) IP addressing for maximum flexibility in administration.
- TAPI-compliant for use with other telephony applications.

Key Points

Nortel IP Softphone 2050 is designed for a broad range of workplaces and communications environments. The Softphone serves small-to-large businesses with single or multiple sites, providing access to Nortel business-grade telephony features of an IP Phone 2004, all from the convenience of a PC. The solution is well suited to campus-based workers who prefer the convenience of a PC to access their telephony and data communications, telecommuters (full-time as well as casual), IP Contact Center agents, and mobile workers who are constantly on the go.

Nortel Mobile Voice Client 2050 (MVC 2050)



The **Nortel Mobile Voice Client 2050** (MVC 2050) also extends access to the same services and capabilities as the Nortel IP Softphone 2050 but is optimized for Pocket-PC PDAs using Windows Mobile 2003 Second Edition. With MVC 2050, mobile workers benefit from the convenience of a single, portable device that supports voice communications with easy-to-use, rich, reliable, and secure business telephony features — as delivered by Nortel Communication Servers — along with support of data communications using the 802.11b WLAN network and the PDA.

Key Points

- Centralizes business applications access (voice and data communications) over an 802.11b WiFi connection, eliminating the need for standalone voice and data devices.
- Thirteen fixed keys that include hold, answer, originate, goodbye, mute, volume up, volume down, directory, services, messages, shift, expand, copy, and quit.
- Four programmable interactive soft label keys.
- Synchronized Microsoft Outlook contact lists with the PC using ActiveSync or beam to another PDA.
- Customized online help with full index search capabilities.
- Customer choice in headset options (choice dependent on PDA type).
- Global IP sounds (GIPS) software supports packet-loss concealment up to 30 percent in high packet-loss environments and included as part of standard offer.
- Designed for intra- and external-to-campus mobile employees when at work and executives who have access to a standards-based 802.11 WLAN network, the soft client delivers the business-grade telephony feature set of the IP Softphone 2050 on Pocket PC-based PDAs for maximum portability.

Technical Specifications

Nortel IP Softphone 2050		Nortel MVC 2050
Platform compatibility	BCM 50/200/400, Nortel Meridian 1, Nortel Communication Server 1000	BCM 50/200/400, Nortel Meridian 1, Nortel Communication Server 1000, Survivable Remote Gateway
PDA support	N/A	Nortel-tested Pocket PC PDAs at time of introduction: Dell® Axim® models X50 v, X5 Advanced, X3 and X3i; Hewlett Packard® iPAQ® 555x series; Toshiba e75x/e80x series, and Symbol MC50
Codecs support	G.711a and/or u law, G.723.1 and G.729a and annex b	G.711a and/or u law
Call control protocol	UNISTim subset over UDP with reliability layer	UNISTim subset over UDP with reliability layer
Audio interface options	Nortel USB audio kit (Enhanced kit for desktop or Mobile USB when traveling) recommended	Plantronics M130i with HP iPAQ and Toshiba PDAs; Jensen JM-11 with Dell Axim PDAs; Headset for Dell Axim 50 V orderable directly from Dell

PC Software	MS Windows XP, 98, 98SE, 2000 Professional, and SPK's 1 & 2	MS Windows Mobile 2003 and Windows Mobile 2003 SE (AKU2)
CPU	Pentium Pro 200 MHz or equivalent	Intel XScale 255 PXA 400Mhz or higher recommended
Memory	128 MB memory (Windows 2000 and later) 64 MB memory (Windows 98)	64 MB ROM or higher recommended
Storage	55 MB free hard-drive space	64 MB RAM or higher recommended
Video	16-bit high color, 800 x 600 resolution or higher	Varies by PDA model
Input/output	One IP network connection One free (powered) port for USB Audio Kit	One wireless LAN IP network connection
Configuration	Static or dynamic DHCP support	Static or dynamic DHCP support

Nortel Multimedia Clients

Nortel Multimedia PC Client (MCS5100)

The Multimedia PC Client is a standalone, SIP-enabled user agent that resides on a personal computer (PC). It provides access to SIP features and services, such as traditional telephone services, and multimedia communications (see Nortel Unified Communications Platforms, Nortel Multimedia Clients, in this guide for details).

Nortel Multimedia Web Client (MCS 5100)

The Multimedia Web Client is a Web-based access client that transforms a PC into a powerful telephone and multimedia communications tool. Unlike the Multimedia PC Client, the Multimedia Web Client is a thin client that does not require preinstallation and is easily accessed through the Internet (see Nortel Unified Communications Platforms, Nortel Multimedia Clients in this guide for details).

Nortel Multimedia Office Client

The Nortel Multimedia Office Client (MOC) is the newest agent for MCS 5100. The MOC is a plug-in for Microsoft Outlook that provides easy access to MCS collaboration tools and eliminates the need for a separate client (see Nortel Unified Communications Platforms, Nortel Multimedia Clients in this guide for details).

Nortel Multimedia Wireless Client for BlackBerry

The Multimedia Wireless Client is available for certain BlackBerry devices. This client provides certain multimedia functions such as presence-based instant messaging (IM) and collaborative capabilities to BlackBerry users (see Nortel Unified Communications Platforms, Nortel Multimedia Clients in this guide for details).

Market Information

Approximately 400 million business users use Microsoft Outlook e-mail client. The Nortel Multimedia and Soft Clients capitalize on this established workplace tool to speed the introduction and acceptance of new services available through the Nortel MCS 5100 suite. The Nortel Office Clients provides tighter integration with Microsoft Outlook than most competitors.

Ordering Information

For further information, contact your local Nortel representative.

Nortel Voice over Wireless LAN Handsets

Overview

The Nortel Wireless LAN (WLAN) handsets provide all the familiar features and functionality of Nortel IP desk phones in a distinct, lightweight unit that is small enough to fit in a pocket. The WLAN handsets provide the user with feature-rich capabilities designed for a broad range of enterprise applications, from general office to industrial to vertical markets such as health care, retail, education, and hospitality.

The Nortel WLAN handsets offer a rich set of features, including menu-driven functions and messaging capabilities that are simple to use, require minimal training, and can withstand the rigors of workplace use. The rugged design does not have moving parts or an external antenna, therefore eliminating the chances of breaking loose parts. Swapped batteries without tools retain uninterrupted service in critical environments such as health care. A complete set of accessories is available to suit users in a wide variety of applications, including headsets, chargers, and carrying cases.

The three WLAN handset models are supported by the Nortel WLAN Telephony Manager 2245 (provides the Quality of Service [QoS], admissions control, and enhanced device battery power conservation for the VoWLAN solution) and the Nortel WLAN Application Gateway 2246 (enables third-party software applications to communicate with the Nortel WLAN handsets).

Nortel WLAN Handset 2210

The WLAN Handset 2210 is a lightweight, durable handset, specifically designed for mobile workplace use within a facility using supported Nortel IP telephony call servers Communication Servers and IEEE 802.11b acceleration access points, and WiFi Access Points (APs) in a wireless LAN. This compact handset offers features and accessories that address the needs of a variety of businesses at an attractive price. The WLAN Handset user can receive calls directly, receive transferred calls, transfer calls to other extensions, make outside calls, and make long-distance calls (subject to the restrictions applied in the facility). The WLAN Handset 2210 is for use on-premise; it is not cellular or satellite phones. The WLAN Handset 2210 has a standby time of 40 hours and talk time of 4 hours.



The Nortel WLAN Handsets 2210, 2211, and 2212 have features similar to the Nortel IP Phone 2004 on the related Nortel Communication Server platform. Examples of features supported on the Nortel Communications Server 1000 release 4.5 include:

- ACD login and ACD logout
- Secondary directory number (DN)
- Calling line ID (CLID)
- Calling party name display (CPND)
- Call forward
- Call park and call park retrieve
- Call pickup
- DN/directed/group
- Call transfer
- Conference

- Message waiting indication and voice mail access
- Group call
- Make set busy and ACD not ready
- Multiple appearance DN, single calls and multiple calls
- Multiple DNs on a single set
- Page
- Call hold
- Last number redial
- Speed call and system speed call
- Corporate directory
- Personal directory, callers list, redial list
- Virtual office

Nortel WLAN Handset 2211



Engineered for demanding environments, the industrial-grade durable design of the Nortel WLAN handset 2211 is small enough to be highly mobile, yet rugged enough for heavy use. The Nortel WLAN handset 2211 has all the features of the Nortel WLAN handset 2210 as well as push-to-talk (PTT) functionality, which allows broadcast communication between employees to eliminate the need for two-way radios or walkie-talkies. The PTT functionality uses IP multicast addresses and requires that multicasting be enabled on a subnet of the corporate wireless LAN. To reduce the effects of broadcast and multicast traffic from devices in other network segments, the wireless LAN can be placed on a separate VLAN or subnet.

Nortel WLAN Handset 2212



Engineered for demanding environments, the industrial-grade design builds upon the features of the Nortel WLAN Handset 2210 and adds increased robustness, a backlit keypad, and an integrated VPN capability.

The Nortel WLAN Handset 2212 has all the features of the 2210, and adds the following capabilities:

- Integrated VPN Client compatible with Nortel VPN Gateways that can be used both within and external-to-campus
- Back-lit keypad for 24-hour use
- Improved robustness (increased drop specification and resistant to liquids)

Technical Specifications

	WLAN Handset 2210	WLAN Handset 2211	WLAN Handset 2212
Radio frequency	2.4000 - 2.4835 GHz		
Transmission type	Direct Sequence Spread Spectrum (DSSS)		
Transmit data rates	11, 5.5, 2, 1 Mb/s, auto rate selection		
Transmit power	100 mW max (adjustable), < 10 mW average		
Wireless QoS	SpectraLink Voice Priority (SVP), WiFi Multi Media (WMM)		
Wireless security	Standard WEP 40 bit and 128 bit WiFi Protected Access (WPA) and WiFi Protected Access 2 (WPA2) with Pre-Shared Key (PSK)		
Display	Backlit dot matrix display with icons and line-status indicators		
Softkeys/navigation	Up to four contextual softkeys; up/down scroll plus select key (on side of handset used during menu operations)		
Call Notification	Audible and vibrating ringers		
Push-to-talk	Not Available	Standard (up to 8 discrete channels)	Not Available
Backlighting	Display	Display	Keypad & Display
Durability	1.83 m (6 ft) drop spec.	7.31 m (24 ft) drop spec.	3.05 m (10 ft) drop spec. (plus liquid resistant keypad)
Charging Options	Single, Dual	Single, Dual, Quad	Dual, Quad
Battery capacity	Up to four hours talk time; maximum of 40 hours standby	Up to four hours talk time; maximum of 80 hours standby	
Dimensions and Weight	14 cm (5.5 in.) 5.1 cm (2.0 in.) 2.3 cm (0.9 in.) approximately 119 g (4.2 oz)	15 cm (5.9 in.) 5.6 cm (2.2 in.) 2.5 cm (1.0 in.) approximately 170 g (6.0 oz)	14 cm (5.5 in.) 5.1 cm (2.0 in.) 2.3 cm (0.9 in.) approximately 119 g (4.2 oz)
Supported Nortel Communication Servers	Nortel BCM50 (Rls 1.0 or later), Nortel BCM200/400 (Rls 3.6 or later), Nortel SRG200/400 (Rls 1.0 or later), Nortel CS1000 (Rls 3.0 or later), Nortel CS2100 (Rls SE 09.1 or later), Nortel CS2000 (Rls SN 09FF or later)		Nortel BCM50 (Rls 2.0 or later), Nortel BCM200/400 (Rls 4.0 or later), Nortel SRG200/400 (Rls 1.5 or later), Nortel CS1000 (Rls 4.0 or later), Nortel CS2100 (Rls SE 09.1 or later), Nortel CS2000 (Rls SN 09FF or later)

IP Client Accessories

Enhanced USB Audio Adapter Kit



Mobile USB Audio Adapter Kit



Overview

The Nortel Enhanced USB Headset Adapter and the Mobile USB Headset Adapter deliver superior audio-quality performance for software-based IP telephony clients. Highly optimized for telephony applications, these Nortel USB Headset Adapters increase personal productivity with single-step access to call answer, call release, mute, and smart functions all at the touch of a button.

Ideal For

- The Enhanced USB Adapter is a desktop version designed exclusively for use with the IP Softphone 2050. It is ideal for users who seek the benefits of centralized business communications on a PC while reducing desktop presence with a smaller footprint.
- The Mobile USB Headset Adapter is a desktop version designed for use with the IP Softphone 2050, MCS5100, and 5200 PC and Web Clients. With its compact design, it is extremely portable, making it an ideal solution for casual telecommuters, traveling workers, or those workers seeking a smaller desktop footprint than that offered by the enhanced version.
- Both USB Adapters can be used by:
 - Distributed workforces that include telecommuters and IP Contact Center agents that require access to the corporate telephony network.
 - Staff members who use the Roaming feature and require access to the corporate telephony network.

Business Challenges

- Do you need superior digital audio quality combined with a user-friendly interface for your remote and mobile employees?
- Do you have casual telecommuters who would benefit from improved efficiency?

- Are you interested in the ability to centralize communications onto the users' PCs?

Typical Applications

- The Enhanced USB Adapter is ideal for the campus-based worker or dedicated teleworker who prefers centralized access to voice and data communications through a PC. The Enhanced USB Adapter supports a third-party external lamp option from Algo Solutions that provides the supervisor a visual indication that the agent is on a call or a message is waiting. The Enhanced USB Adapter, ordered as a complete USB Audio Kit with Nortel-tested third-party headsets, provides superior voice quality and user experience.
- The Mobile USB Adapter is ideal for workers who are on the go on or off the campus. The Mobile USB Adapter has a blue backlit LED to signal that the adapter is working and comes with a belt clip. It is compatible with third-party Motorola cellular telephone headsets (2.5mm headset jack) to allow single headset use for these cell phones along with the Nortel IP Softphone 2050 and MCS5100 PC and Web Clients. In addition, it is fully compliant with version 1.1 of the USB device specification and Windows plug-and-play specifications (Support on Windows XP, 2000 Professional and SPKs 1 and 2, Windows 98, and Windows 98SE).

Key Points

- Nortel USB Headset Adapters provide a controlled, high-quality audio environment with quick and easy access to commonly used functions.
- The USB Headset Adapters are superior to sound cards in that they offer the ability for a Softphone to have an absolute and predictable loss and level plan. They offer simple installation using standard Windows drivers.
- They are fully compatible with the suspend and resume functions for effective use with battery-operated laptops.
- The PC USB power subsystem provides power to the Adapter.
- The only connections needed are standard USB cable to the PC and an RJ-9 jack for headset and handset.

Features and Benefits

- Both of the Nortel USB Audio Adapters include the following feature buttons to provide one-touch access directly from the adapter, as a quick alternative to bringing the Nortel IP Softphone 2050 Client to the foreground of the PC or laptop display:
 - Call answer and initiation button provides an additional option for quickly answering incoming calls or initiating new calls.
 - Mute button silences or restores audio during an active call.
 - Mute light provides visual lamp indication that the active call is on mute.
 - Adjustable volume keys are dual-function keys. The user can adjust the volume from the navigation keys on the adapter or can access the navigation menu with softkeys.
 - Release button disconnects calls from the adapter unit.
 - Maximize and minimize button lets users enlarge and reduce the client application to make access to other Windows-based applications easy.
- Incoming call and message waiting lamp indicator, located at the top of the adapter, lets the user know there is an incoming call or a message waiting. These are the same message-waiting and incoming-call indicator lamp conditions used by Nortel IP Telephony Clients.

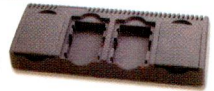
WLAN Handset 2000 Series Accessories

Chargers

The desktop dual-slot charger is designed to charge the WLAN handsets 2210, 2211, and 2212, and their standalone batteries. The Nickel-Metal Hydride (NiMH) battery pack can be fully charged in 1.5 hours. Dual-slot chargers are handset- and battery-specific and are not interchangeable.



The Quad charger for the WLAN Handsets 2211 and 2212 recharges up to four battery packs in 1.5 hours. The quad charger accepts only battery packs, not handsets. The quad charger is the optimum charger to use when a WLAN Handset 2211 or 2212 is used within a shift environment and shared among multiple users.



Headsets

The WLAN handset 2210, 2211, and 2212 offers an integrated headset jack for handsfree operation. The dynamic noise-canceling headset is hearing-aid compatible and radio-hardened and has been specifically designed to operate with the Nortel WLAN Handsets without any electro-magnetic interference. Note that using off-the-shelf commercially available headsets can cause electro-magnetic interference (EMI) and result in noise being injected into the telephone network, possibly placing the user in violation of governmental regulations.



Holsters

The WLAN handset 2210, 2211, and 2212 have several holster options available, including spring-loaded belt clips that attach to the back of the handset. The WLAN Handset 2211 includes a flexible case with a coiled-cord tether lanyard and belt clip.



Configuration Cradle

The Graphical User Interface application for the Nortel WLAN Handset Configuration Cradle makes initial configuration and ongoing administration of WLAN handsets easy. The Configuration Cradle improves the productivity of system administrators by allowing configuration changes to be quickly loaded into handsets.

Configuration cradles are also useful for changing complex or time-consuming settings with the WLAN Handset, such as the WPA and WPA2 pre-shared keys. Configuration cradles help administrators troubleshoot failed handsets. The Configuration Cradle connects to a Windows 2000 or Windows XP computer using an RS-232 serial cable.



Nortel Unified Communications Platforms

The Nortel Unified Communications platforms incorporate the latest technologies to help enterprise users communicate effectively and efficiently through a host of real-time applications ranging from collaboration and to communicate no matter where they are. For enterprises with 50 users as well as those with thousands, the platforms serve any organization with a mobile or geographically dispersed work force. Equally important, the simplicity and reliability of the solutions result in cost savings and improved productivity for the enterprise. Using the Multimedia Client applications and a PC, users can send instant messages, send and receive video, share text and images, and collaborate in real time.

- Nortel Multimedia Communication Server (MCS) 5100
 - Audio and Video Conferencing (Meet Me)
 - Web Collaboration
 - Mobility
 - Instant Messaging (IM), Presence, and Collaboration
 - User Personalization
- Nortel Multimedia Security
 - Nortel Secure Multimedia Controller 2450
- Nortel Multimedia Clients
 - Nortel Multimedia PC Client (MCS 5100)
 - Nortel Multimedia Web Client (MCS 5100)
 - Nortel Multimedia Office Client (MCS 5100)
 - Nortel Multimedia Wireless Client for BlackBerry
- Nortel Converged Office
- Nortel Messaging Portfolio
- Call Pilot
 - CallPilot Integrated
 - Nortel Messaging 100
 - Nortel Messaging 150
 - CallPilot Mini
 - CallPilot 200
 - CallPilot 703t
 - CallPilot1005r

Nortel Multimedia Communication Server 5100



Overview

The Nortel award-winning Multimedia Communication Server (MCS) 5100 offers powerful real-time collaboration capabilities to enhance teamwork and interactions between team members during virtual meetings. With MCS 5100, people can share information and communicate quickly with others in real time.

The Nortel MCS 5100 is a network-based, SIP application-delivery solution that seamlessly integrates IP Telephony, multimedia conferencing, instant messaging, presence, and other collaboration tools to employees anytime, anywhere. The MCS 5100 hosts innovative communications, real-time collaboration and productivity services for enterprise users. Nortel MCS 5100 uses open, industry-standard hardware to evolve time division multiplexing (TDM) and IP networks to collaborative, multimedia networks.

Enterprises deploy Nortel MCS 5100 alongside an enterprise current network infrastructure, enriching the enterprise user's communications experience and providing new SIP multimedia applications.

Nortel MCS 5100 is about transforming communications within an enterprise, improving the way users communicate, making communication transactions instantaneous and allowing users to make choices about their response to others. With the MCS 5100, users gain control over their communications priorities and they can respond based on personal preferences. Users decide how, where, and when others can communicate with them. Nortel MCS 5100 unites existing voice services and new multimedia applications such as instant messaging, IM chat, presence, file exchange, whiteboard collaboration, Find me/Follow me call handling, and call screening, "Meet-Me" and impromptu audio conferencing, and Web collaboration. The MCS 5100 also brings video options to the user, options that deliver increased productivity, collaboration, mobility, and service ubiquity.

Ideal For

- Enterprises with a distributed or mobile workforce such as sales representatives, executives, and teleworkers that collaborate, share ideas, and exchange information
- Enterprises with a distributed or mobile customer-support staff that collaborate, share ideas, and exchange information
- Enterprises with distributed research and development (R&D) teams collaborating on a new project
- Enterprises with telecommuting programs that use multimedia tools to keep users connected and productive, extending voice, video, and collaborative real-time communications to users irrespective of location
- Enterprises with conferencing service needs with an eye to reduce travel costs and increase collaboration with "Meet-Me" audio and video conferencing. Scaleable, Nortel MCS 5100 provides in-house conferencing with multimedia integration. Nortel MCS 5100 provides visual notification of meeting events such as joined or left the conference, waiting on the bridge and transfers.
- Enterprises that want to bring low-cost video conferencing to the desktop.
- Enterprises that need user productivity tools to increase productivity even when the user is away from the office and for individuals who work in areas remote from their work teams so that they can collaborate effectively.
- Businesses with as few as 50 users and those that scale up to 60 000 users.
- Businesses that are moderate to heavy users of audio conferencing and use an external service provider.
- Businesses that want to increase user productivity and want new multimedia features for their staff while keeping the existing feature set and existing digital handsets.
- Businesses that want to reduce costs for toll charges, calling cards, and cellular phone use.
- Teachers who move from room to room and

need to stay in touch.

- Health care workers who move between their offices, clinics, homes, and hospitals and need to stay in touch.

Business Challenges

- Do you need your employees to work more productively in a competitive world?
- Does business take you outside of the office, while expectations are that you still be productive and available?
- Do you need improved interaction and collaboration with colleagues for a more effective and rewarding workplace?
- Do communications and collaboration costs hurt your bottom line?
- Are travel costs to attend meetings affecting into your budget?
- Do you have many employees that work from home (part time or full time)?
- Is being able to communicate while away from the office important to you?
- Do you have teams of geographically separated employees that need to collaborate?
- Do you pay a lot for audio conferencing services?
- Do delays in decision making slow down your operations?
- Are the costs of deploying video too prohibitive?
- Do your users demand Instant Messaging (IM) services?
- Is IM deployment out of control in your enterprise?
- Do security concerns keep you up at night?

Typical Applications

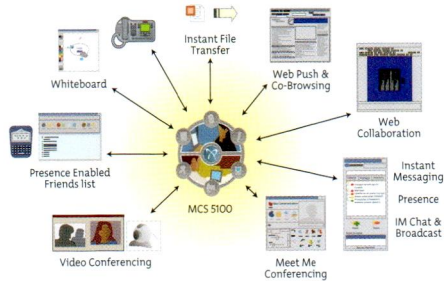
- **Audio and Video conferencing (Meet Me)** enhances productivity through multimedia applications and services such as video calling, impromptu video conferencing, Meet Me audio and video, and Web conferencing. Example business sectors that benefit from audio and video conferencing are:
 - education
 - health care
 - finance
 - government
- **Web collaboration** enables users to collaborate on documents or applications

without being in the same room. This reduces travel costs, saves time, and enables users to share information quickly and in real time.

Web collaboration makes meetings productive and efficient for attendees by using a shared whiteboard, clipboard share, file exchange, Web push, collaborative browsing, and instant messaging. Example applications include:

- training
- project meetings
- product demonstrations
- customer support
- **Mobility** is generally applicable for sales, executives, and teleworkers. These employees must be able to reach others and be reachable. The business case for mobile users can be quite strong. Reducing costs for toll charges, calling cards, and cellular use can be significant to prove a business case. Mobile users must have communications tools that go beyond simple voice such as instant messaging and presence as this enables them to use real-time communications means when voice communications are less practical. Use of presence enables users to check the availability of others and to communicate their own presence.
- **Instant Messaging (IM), presence, and collaboration** are powerful tools that the market is beginning to fully embrace. While deployments in the past have been brought about by individual groups of users making use of free public services, this does create security vulnerabilities and lets user communications flow freely unencrypted over the public Internet. Bringing these capabilities in-house eliminates these problems and enables users to communicate and collaborate freely.
- **User personalization through the Personal Agent** gives users control over their availability by using Find Me/Follow Me capabilities. Example applications of this feature are:
 - technical support
 - customer support
 - mobile sales representatives

Network Diagram



Key Points

• Hard dollar cost savings:

- Substantial savings realized when the enterprise removes third-party audio conferencing expenses through native Meet-Me audio conferencing.
- Cut in travel expenses using point-to-point and multipoint video conferencing and collaborative tools that replace of face-to-face internal meetings.
- Time savings by using collaborative tools means increased profits, especially for frontline sales.
- Mobile users cut their calling card and cellular airtime charges using MCS 51000 IP telephony.
- Generate Nortel MCS 5100 cost savings and revenue recapture scenarios for the enterprise with the Nortel convergence tool at www.nortel.com/voip_tool. Look for multimedia applications under the engaged applications tab.
- Telecommuting initiatives reduce real estate and support costs. For example, Nortel realizes an average savings of five to nine thousand dollars annually in real estate and associated expenses for each telecommuter.
- Converged desktop brings SIP-enabled services to all users regardless of the device type: analog, digital, or IP set.

• Simplicity:

- Consolidation means simplified cabling, installation, and maintenance.
- Consolidation over IP reduces network

complexity and training.

- Administrators add new users quickly. Moves are simple remote operations and user profile changes are point-and-click.
- SIP is an open-industry-standard protocol that enables third-party compatibility and promotes the exchange of new applications and clients based on customer need.
- LDAP support simplifies user setup and operations.
- Automatic client software update feature speeds the deployment process.

• Productivity:

- Time-consuming additions, moves, changes customization, and user requests require less effort from IT staff. IT Staff have more time to focus on the development on more critical projects.
- Users control their communications preferences to improve their ability to interact with customers, team members, and management.
- Users can effectively manage their interruptions with preferences.
- Presence capability reduces time needed for collaboration.
- Tools such as instant messaging provide real-time responses to queries.
- Instant message helps users reduce the number of interruptions.

• Collaboration:

- Video calling and conferencing and web collaboration reduce travel and encourages distributed workforce collaboration.
- Integrated collaboration tools (file exchange,

Web push, and shared whiteboard) simplify communications and ease the learning curve.

- Instant messaging and IM chat allow sidebar discussions for quick resolutions.

- **Mobility:**

- E911 zoning provides security and assurances should the need for emergency services arise.
- With dynamic registration users can connect to the IP network and their profiles go with them to enable them to log in to any device to accept and make calls.
- Dialing plan and privileges follow employees (network-based). Employee “phone number” and calls automatically are rerouted to wherever the employee is.
- Solution provides location independence for mobile employees (Find me/Follow me services).
- Simultaneous ringing: Office, mobile, and home phones ring at the same time; wherever the person answers the call.
- With sequential ringing the system tries office, then mobile, and then home phone.
- Extend multimedia communications to mobile devices such as the RIM Blackberry.

- **Personalization:**

- Users control their communications experience dictating how, where, and when they receive their communications.
- Call routing is established by the users to eliminate missed calls when they are on the run.
- Dynamic call handling helps to ensure real-time call control.
- Flexible personal call management allows end users to control how and when they may be reached.
- Instant message screening reduces disruptive interruptions.
- Multiple language support allows users to personalize their work environments.

- **Reliability:**

- High-performance, industry-standard hardware has built-in reliability to avoid business disruption.
- The system capitalizes on existing Nortel IP

Phone 2004, Meridian 1 digital telephones, as well as Nortel Unified Messaging (CallPilot) and contact center solutions.

- System provides alternative disaster recovery solution to help ensure business continuity.
- Built from carrier-class architecture, redundant, and nonredundant hardware configurations support the most demanding networks.

- **Scalability:**

- Network-centric architecture supports the agile needs of today’s enterprises allowing them to scale their communications solution based on changing requirements.
- MCS 5100 is scaleable from 10 to 60 000 users.
- System provides Meet-Me conferencing services for up to 1 500 ports per cluster and tens of thousands per network.
- Flexible choice is available in user client options, IP Phone 2002, 2004 and 2007, multimedia PC Client, Web client, third-party SIP phone, and converged desktop (analog, digital, and IP set).
- Teleworker and mobile worker solutions that parallel those in the headquarters site reduce training and extend multimedia values.

Features and Benefits

The Nortel MCS 5100 supports an impressive suite of integrated multimedia capabilities for users to enjoy a feature-rich multimedia experience. The following summarizes the key capabilities:

- Desktop video calling is delivered through coordinated video display on the PC screen and audio conversation using the hard or soft client. Low-cost desktop multipoint video conferencing extends video to all users.
- Presence provides notification on the status of “watched” users. When users are on the phone, dynamic presence shows them as being on the phone, and when they are away from their desk, the presence changes to inactive.
- Picture calling line ID presents a picture of the originating caller on the PC screen and the

calling line ID (CLID) for incoming and outgoing communications.

- Personal agent and call screening provides a Find me/Follow me service, with call-screening provisioning for communication personalization. Users define who, where, when, and how callers can reach them. Call screening and routing depends on who is or which group is calling and on the time of the calls (time of day, day of week). Calls can be directed to try multiple locations at one time (office, cell phone, and home), or to ring sequentially, or a combination. This solution provides tremendous flexibility and control of the communication experience.
- Network-based incoming and outgoing call logs are kept for easy access and retrieval.
- Personal and global directories allow users to store information and use these directories for click-to-call capability.
- Click-to-call allows users to click from the directory on the multimedia PC client, from the incoming or outgoing call logs, or from the Outlook contact list or inbox to place calls.
- Mobility solution provides the primary voice service for users who are not in their offices, or those who do not use existing voice infrastructures.
- Conferencing supports Meet-Me media conferencing to provide multimedia services such as visual notification to the conference chair of all participants entering or leaving the conference. Conferencing also supports file exchange, Web push and collaborative browsing, and allows instant message chat for sidebar real-time communications. This solution delivers an impressive return on investment (ROI) over outsourced conference solution and improved functionality.
- Collaborative applications provides a suite of applications such as instant messaging, Web collaboration, IM chat, file sharing, shared whiteboard, and Web pushing. Video conferencing is another key application in today's collaborative environments that improves the effectiveness of distance conferencing.
- PDA support offers device support on PDAs

such as the RIM Blackberry giving users extended use of presence, secure instant messaging, Click-to-Call, and Route management.

- Unified messaging delivers voice mail to most e-mail applications.

Market Information

Nortel was first to bring a commercially available, enterprise-scale Session Initiation Protocol (SIP) application solution to market. In September 2005, Miercom rated the Nortel MCS 5100 suite as one of the most effective multimedia advanced application packages on the market. Since Nortel introduced the, MCS 5100, several high-profile customers have deployed it at their installations. The MCS 5100 continues to be the only fully integrated, real-time multimedia collaboration solution in the market today.

Technical Specifications

Key Related Products

- Communication Server 1000, Communication Server 2100, Meridian 1 PBX, Meridian IP-enabled, Business Communications Manager, Norstar key system, SL-100, third-party gateways (industry-standard protocols) compatibility supported. Gateway control protocols H.323 v4 SIP (Session Initiation Protocol)

Signaling protocols

- MTP3-User Adaptation Layer (M3UA)
- ISDN Q.921-User Adaptation (IUA)

Server and Client intercommunication protocols

- Server: SIP, SIP-T
- Client: UNISTIM, IPv4, SIP
- Management: XML, FTP, SNMP vers. 2c, Accounting, IPDR (XML-based)

Signaling Interfaced

- European Telecommunications Standard Institute (ETSI) and American National Standards Institute (ANSI) ISUP
- ETSI and ANSI PRI
- Other country interfaces, including, but not limited to, Spain and China

Ordering Information

For further information, contact your local Nortel representative.

Nortel Multimedia Security Portfolio

The Nortel Multimedia Security portfolio provide enterprises with a comprehensive approach to creating a Secure Multimedia Zone between the Local Area Network (LAN), the Wide Area Network (WAN), and the call servers. The SMZ protects business-critical converged or multimedia infrastructure resources from internal threats, such as disgruntled employees, compromised systems, or infected laptops. Internal threats can be more severe than external threats for these critical infrastructure components.

The portfolio includes:

- Nortel Secure Multimedia Controller 2450

Nortel Secure Multimedia Controller 2450



Overview

The Nortel Secure Multimedia Controller (SMC) 2450 provides a comprehensive approach to providing a "Secure Multimedia Zone" that protects business-critical converged or multimedia infrastructure resources from internal attacks. The SMC 2450 is a transparent network appliance that is the front-end of the Secure Multimedia Zone that includes the VoIP (Nortel Communication Server 1000) or multimedia servers (such as Nortel MCS 5100).

Ideal For

- Enterprises with Nortel Communication Server 1000 or Multimedia Communication Server 5100 networks that want to augment a layered security approach to secure the internal multimedia zone.
- Any business that wants a security upgrade for existing customer infrastructures and added value for new customer opportunities.

Business Challenges

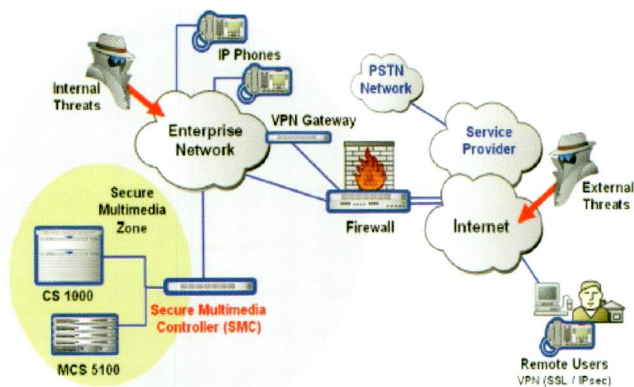
- Does your business need secure multimedia communications with an application firewall to protect critical business services from within the secure multimedia zone?
- Does your business want to improve improve the confidentiality and integrity of your converged multimedia solution?
- Does your business need simplified

administration and management for your converged multimedia solution?

Typical Applications

- **Privacy protection:** Companies where shielding communication from unauthorized access such as eavesdropping on media, signaling or OAM traffic is important
- **Service reliability:** Companies whose customers depend on protection against unwanted attacks, as well as geographic redundancy and survivability
- **Protection against theft:** Companies that need to protect their critical business information against loss through eavesdropping
- **Cost-effective protection:** Companies that cannot afford to have the cost of unauthorized access to the company cannot exceed the value of unauthorized access protection

Network Diagram



Key Points

Multimedia Security: The SMC 2450 is a purpose-built application firewall designed specifically to secure the multimedia zone.

Nonintrusive: The SMC 2450 allows the communication servers to offload some signaling encryption to avoid affecting system capacity. The system can then recover quickly in a secure mode after a major network outage.

Simplified Deployment: An embedded stateful filter protects services operating in the secure multimedia zone by using automatically generated access control lists and filtering policies. Preconfigured policy settings reduce administrative errors, simplify deployment, and help to ensure the integrity and availability of the business-critical, converged, multimedia infrastructure.

Experience of a global leader: With more than a century of experience, and customers in 150 countries, Nortel is shaping the evolution of communications and continuing its tradition of innovation by providing secure solutions that ignite and power global commerce while helping solve the world's greatest communications challenges.

Features and Benefits

The Secure Multimedia Controller 2450 offers:

- secures multimedia communications with an application firewall to protect critical business services from within the secure multimedia zone
- encryption and security for the signaling path for IP phones to improve the confidentiality and integrity of the converged multimedia solution
- high availability options to increase the resiliency of the solution and help to ensure a protected environment suitable for all customer configurations
- simplified administration and management to decrease startup time and to reduce the overall cost of securing multimedia communications

Market Information

In protecting critical infrastructure components, market statistics indicate that many organizations focus on external attacks and fail to properly address internal threats that often can be more damaging. Perimeter scanning without other layers of defense at the internal network level can enable an attacker, once authenticated from inside or outside the company, unmonitored access to network resources.

Therefore, it is important to create a Secure Multimedia Zone (SMZ) around the converged or multimedia communication infrastructure to protect against denial of service attacks and other threats to help ensure the integrity and availability of the services delivered by the converged or multimedia infrastructure.

The Nortel Secure Multimedia Controller 2450 is easier to deploy for multimedia communications than any other on the market. The SMC 2450 optimizes security solutions to address today's needs and tomorrow's challenges. The Nortel SMC 2450 exceeds market requirements for converged voice and data client portfolios.

Technical Specifications

Hardware:

- 2.8 G Pentium 4-based CPU
- 512 MB RAM
- Two on-board Gigabit Ethernet
- Quad Gigabit card

Software:

- Hardened version of the LINUX OS (similar to other Nortel firewall products)

Ordering Information

For further information, contact your local Nortel representative.

Nortel Multimedia Clients

Overview

Nortel Multimedia Clients include PC Client, Web Client, Multimedia Office Client, and Wireless Client for BlackBerry. Now you can talk, send instant messages, send and receive video, share text and images, and collaborate in real time using a single Internet connection from your PC and the Nortel Multimedia Clients. The Multimedia Client applications provide a wealth of powerful communications features from traditional telephone service to advanced multimedia communications such as video calling, instant messaging, call screening, real-time call disposition, conferencing, file sharing, and shared whiteboard. Advanced Web communications include Web collaboration, pushing Web pages, and collaborative browsing with customers, co-workers, and associates.



The MSC 5100 is a powerful platform that extends the newest Session Initiated Protocol (SIP) multimedia applications to users, applications such as instant messaging (IM), presence, collaboration, and video calling. These applications take users to the next application integration level.

The Nortel Multimedia Clients help users control communications over a PC headset or over the Nortel IP Phone 2002, 2004, or 2007 while increasing productivity and efficiency and gaining control over daily communications. Users efficiently perform diverse communications tasks in a single session, bring the human touch of face-to-face contact to remote communications and manage incoming and outgoing communications in new ways.

Nortel offers four Multimedia Clients:

- Nortel Multimedia PC Client
- Nortel Multimedia Web Client
- Nortel Multimedia Office Client
- Nortel Multimedia Wireless Client for BlackBerry

Ideal For

- Enterprises with geographically separated departments such as research and development teams that regularly collaborate on new projects.
- Any business that wants to use multimedia tools to keep users connected and productive, extending voice, video, and collaborative real-time communications to users regardless of location.
- Customers who want to reduce the cost of telecommuting.

Business Challenges

- Do you have work groups at diverse locations?
- Is scalability important to your business?
- Do you want to eliminate your out-sourced audio conference service?
- Do you need to integrate multimedia applications into a single user interface to provide an integrated user experience?

Typical Applications

- Real-time collaboration and conferencing enhance productivity with services like Meet-Me media conferencing, video, IM, IM chat, shared whiteboard, Web push, collaborative browsing, application sharing, and file exchange.
- Mobile users have access to communications.

Key Points

The Multimedia Clients support:

- IP Calls allow users to make calls over the Internet or a company intranet, complete with video to allow the user to see and hear their caller.
- Mobility provides E911 capabilities (North America only), automatic firewall detection, global address book access from clients, and network-based call logs to make it easy to work anywhere at anytime.
- Audio options permit users to use a headset during calls. Optionally, workers can use a

separate microphone along with the computer speakers for the voice portion of the call.

- Call management enables users to keep personal directories of the people they call regularly, initiate calls by clicking a name, view call logs, and conference-all with up to 15 participants
- Call screening enables the user to choose whether to answer a call, play recorded greetings, send the call to another number, send it directly to voice mail, or redirect it to e-mail or a Web site.
- Collaborative applications enable users to enjoy new levels of teamwork among geographically separated teams by sharing files, images, text, or even a shared workspace where all call participants can view and manipulate material together.
- Multimedia communications enable users to receive live video streams, co-browse the Internet with a remote party, or send an instant message on the same call.

Features and Benefits

- Advanced call logging to track incoming, outgoing, and missed calls.
- Personal address book to store addresses on the network and synchronizes them across Multimedia Clients.
- Global address book to store global addresses on the network (Multimedia PC Client only).
- Presence to show who is online.
- Phone clients to control Nortel IP Phone 2002, 2004, or 2007 (Multimedia PC Client only).
- Call hold and retrieve to place calls on hold or retrieve them.
- Call park and retrieve to park and retrieve calls.
- Call transfer (blind or consult) to transfer calls to another phone.
- File transfer to send and receive files.
- Sharing tools to collaborate on projects such as Web push, shared whiteboard, shared clipboard (only Web push supported for Multimedia Web client)

- Do not disturb (DND) to allow users to work with no interruptions.
- IM Chat to create a chat room or join a private, public, or public with password chat room.
- Call handling to decline, redirect, or ignore incoming calls.
- Instant messaging to send and receive text messages.
- Video calls to place and receive video calls (on demand, one-way, and two-way video).
- Conference calls to host calls (requires network conference server).
- Distinctive ring tones to assign unique ring tones to callers (not supported on Multimedia Web Client)
- Optional ability to make calls from and import contacts from Microsoft Outlook 2000 and Microsoft Outlook 2002 (supported when using from Outlook for PC Client only).
- Single tool for all communication needs (Multimedia Office Client).

Multimedia PC Client

The Multimedia PC Client is a stand-alone, SIP-enabled user agent that resides on a personal computer (PC). It provides access to SIP features and services such as traditional telephone services, and multimedia communications. See the list of features above.

Multimedia Web Client

- The Multimedia Web Client is a Web-based access client that transforms a PC into a powerful telephone and multimedia communications tool. Unlike the Multimedia PC Client, the Multimedia Web Client is a thin client that does not require pre-installation and is easily accessed through the Internet. See the list of features above.

Multimedia Office Client

The Nortel Multimedia Office Client (MOC) is the newest agent for MCS 5100. The Multimedia Office Client is a plug-in for Microsoft Outlook that provides easy access to MCS collaboration tools and eliminates the need for a separate client. From within Outlook, users can access the following features:

- view the presence of friends
- modify their own presence
- launch a collaboration session from directories, contacts, e-mails, and call logs
- handle incoming calls in real-time
- view incoming/outgoing call logs
- add SIP addresses to Outlook Contacts
- access voice mail
- access their MCS Personal Agent
- import contacts from the MCS Global Address Book
- synchronize contacts with their MCS Personal Address Book
- manage groups and friends lists
- control hard client sets in one of two ways
 - 200x IP phones using client-set mode
 - Converged desktop with Communication Server 1000-based analog, digital, and IP phones

Multimedia Wireless Client for BlackBerry

The Multimedia Wireless Client is available for certain BlackBerry devices. This client provides certain multimedia functions such as presence-based instant messaging (IM) and collaborative capabilities to BlackBerry users.

Multimedia Wireless Client for BlackBerry supports the following capabilities:

- **Presence:** Users can set their presence and query the presence of their colleagues. The same icons used in the MCS PC client are used to display the presence settings.
- **Presence Alerts:** Users can request to be alerted when a friend's presence changes.
- **Instant Messaging:** Users can exchange instant messages securely with other MCS users.
- **Call logging:** records of incoming calls to your MCS enabled phone line are delivered to the BlackBerry handheld.
- **Click-to-Call:** Users can set up calls using MCS. Calls can be delivered to the BlackBerry handheld, the user's SIP address, or other numbers configured in client preferences only if the BlackBerry is voice enabled; otherwise it is

a means to remotely setup a Click-to-Call. This is similar to the Click-to-Call capability available through the MCS 5100 Personal Agent.

- **MCS Personal Address Book:** The personal address book from the MCS 5100 is downloaded to the BlackBerry to give the user access to SIP addresses and other phone numbers stored in the MCS directory.
- **Call routing:** Users can enable, disable, and reorder MCS Personal Agent routes from the Handheld Device (this is for routes created using the MCS Personal Agent).
- **Set temporary address:** Users can create a temporary route to redirect calls to a different SIP address or phone number, and they can specify how long the route should be active. The temporary route is stored in the BlackBerry handheld.
- **Corporate Directory:** Users can search the corporate phone directory for numbers and use Click-to-Call to start a phone conversation.
- **Voice mail notification:** Users with voice mail that is compatible with the MCS 5100 receive a voice mail indicator on the BlackBerry.

Market Information

Approximately 400 million business users use the Microsoft Outlook e-mail client. The Nortel Multimedia Clients capitalize on this established workplace tool to speed the introduction and acceptance of new services that are available through the Nortel MCS 5100 suite. The Nortel Multimedia Office Client provides tighter integration with Microsoft Outlook than most competitors.

Technical Specifications

Minimum hardware and operating system requirements

- 550 MHz Pentium-class or equivalent processor
- Windows 98 (SE), Windows Me, Windows NT 4.x with SP5, Windows 2000, or Windows XP
- 28.8 Kb/s modem
- Microphone and full-duplex sound card
- 48 MB free RAM (This requirement is in addition to the memory requirements of the OS and other concurrent applications.)
- 28 MB (Web Client) 75 MB (PC Client) free hard disk space (if Java Runtime Environment

- needs to be installed, otherwise 8 MB)
- Netscape 7.0 or higher, or Internet Explorer 6.0 or higher (Web client only)
- Cookies enabled
- Java script enabled
- 640x480 at 8 bpp (256 colors) VGA graphics card
- Mouse

Recommended hardware and operating system requirements

- 1 GHz (or higher) Pentium-class or equivalent processor
- Windows XP, Windows 2000, Windows 98 (SE), or Windows NT 4.x with SP5
- 56 Kb/s modem or faster network connection (Cable modem, DSL, 10 base-T Ethernet connection provide an improved user experience.)

- Full duplex sound card with headset (microphone-headphone combination)
- 64 MB free RAM (This requirement is in addition to the memory requirements of the OS and other concurrent applications.)
- 28 MB (Web Client) 75 MB (PC Client) free hard disk space (if Java Runtime Environment needs to be installed, otherwise 8 MB)
- Netscape 7.0 or higher, or Internet Explorer 6.0 or higher (Web client only)
 - Cookies enabled
 - Java script enabled
- 800x600 at 16 bpp (65 536 colors) VGA or better video graphics card
- Mouse

Ordering Information

For further information, contact your local Nortel representative.

Nortel Converged Office

Overview

The Nortel Converged Office solution integrates Nortel business-grade telephony of the Communication Server 1000 with real-time multimedia communication and the remote call control provided by Microsoft Live Communications Server 2005 and Office Communicator products. This solution delivers desktop collaboration and communication systems in an open, standards-based environment without requiring incremental software on the user's PC. This versatile, enterprise-class architecture includes four key components from Microsoft and Nortel:



- Microsoft Office Communicator 2005 soft client provides the user interface.
- Microsoft Office Live Communications Server 2005 provides real-time, multimedia communications such as instant messaging, presence, directory lookup, file exchange, access to public instant messaging, and point-to-point video.
- The Nortel Communication Server 1000 (CS1000) Release 4.5 IP PBX delivers hundreds of business-grade telephony features for as many as 15 000 IP clients, desktop phones, and wireless devices with such features as telephony presence and integrated Click-to-Call voice calls over IP.
- Nortel Application Center provides optional capabilities such as unified messaging, contact center functions, interactive voice response (IVR), and Web integration that can integrate into an overall enterprise solution.

The Nortel Converged Office solution makes it easier than ever for colleagues and business partners to conduct business, to spend their time productively, and to remain in touch wherever they use the business-grade telephony of the Communication Server 1000 with the real time multimedia communication and remote control provided by Microsoft Live Communications Server 2005 and Office Communicator 2005 products. The Converged Office solution enables the use of the Microsoft Desktop without requiring incremental software on the end user's PC.

The Nortel Converged Office solution is tightly integrated, with direct connectivity and redundant interfaces based on SIP and SIP computer-telephony integration (CTI). This architecture makes the solution easy to deploy, manage and use—and highly reliable.

Ideal For

- Enterprises with geographically separated departments such as research and development teams that regularly collaborate on new projects
- Any business that wants to use tools that keep users connected and productive, that extends voice, video and collaborative real-time communications to users regardless of location
- Businesses that want one location for their users communication needs
- Businesses that want to benefit from the cost savings of IP Telephony through VPN access to their private networks.

Business Challenges

- Does your business want integrated multimedia and IP telephony using Microsoft LCS?
- Does your business need instant messaging and presence?

- Does your business have mobile workers who need to stay in touch wherever they are?
- Does your business want to introduce new multimedia applications to enhance productivity and promote collaboration?
- Does your business want to reduce communication costs?

Typical Applications

- Businesses that want to improve workforce mobility, productivity, and efficiency.
- Businesses that want to use automated self-service multimedia applications.
- Businesses that want application scalability.
- Businesses that want to personalize their customer service.
- Businesses that want flexibility and choices to meet their business needs.

Key Points

The Nortel Converged Office supports:

- best-in-class telephony solutions, closely integrated with Microsoft desktops
- presence-enabled integrated communications from within Microsoft Office
- open SIP computer-telephony interface for third-party and custom applications
- remote call control using SIP CTI interface

Features and Benefits

- Tight Integration of IP Telephony with Microsoft Office Communicator.
 - Extends the Nortel business-grade telephony features such as Call Forward No Answer, Group Call, Unified Messaging, Call Detail Recording, and Attendant Recall to Converged Office users.
 - Enables use of customer voice networks and Nortel-provided dial plans for Office Communicator clients when placing telephone calls.
 - Supports simultaneous ring support from the Nortel Call server to enable the user to answer incoming calls using the Microsoft Office Communicator or the Communication Server 1000 Desktop client phone.
- Public and Private Gateways for Microsoft Office Communicator
 - Enables calling between Microsoft Office Communicator, Communication Server 1000, and MCS 5100 clients, and PSTN. Users can access all telephony network resources through the Office Communicator client.
 - Provides call accounting for Communicator-originated calls.
- Business Continuity of Remote Call Control and Telephony Gateway
 - Provides convergence beyond the Microsoft desktop Instant Messaging client and into the full suite of Microsoft applications and documents.
 - Allows users to invoke many of the telephone features of the Communication Server 1000 phones through the intuitive user interface of the PC client.
 - Provides the ability to monitor the presence

states of users when they are on another call.

- Allows the Office Communicator client to complement the voice communications between two users by offering the ability to add other media types, such as video, instant messaging, file and application sharing, to a voice call in real time.
 - Supports geographic redundancy through its redundant SIP CTI design.
 - Capitalizes on the redundancy features of the Communication Server 1000 SIP Gateway and NRS with the Telephony Gateway design.
- Numbering Plan Translations
 - Uses Active Directory to resolve user ID and phone number translations. A software component, the Multimedia Convergence Manager, helps to ensure the proper interoperability between the two systems with respect to protocols, users, and phone numbers managed within the Active Directory.
 - Compatibility with Nortel Applications Center suite
 - Meet Me
 - Voice mail
 - Contact center
 - Web collaboration

Market Information

Nortel continues to demonstrate its leadership position in the marketplace by introducing the Converged Office solution to deliver superior telephony integration. With the Nortel best-in-class IP Telephony and SIP applications and tight integration with Microsoft LCS, the Nortel Converged Office solution is second to none.

Technical Specifications

Recommended platform to deploy Live Communications Server 2005

- Dual Intel Xeon 3.06 GHz, 1 MB Cache, 533 MHz FSB (front side bus)
- 2 GB DDR (double data rate), 266 MHz RAM
- 2 × 18-GB hard disks (15 000 rpm SCSI)
- 100 MB network adapter
- MSDE 2000 Service Pack 3a
- two disk drives (one for the database and

one for the database transaction log)

- Microsoft Windows Server 2003 Standard Edition

Recommended hardware configuration for Live Communications Server 2005, Enterprise pool

- Dual Intel Xeon 3.06 GHz, 1-MB Cache, 533 MHz FSB
- 2 GB DDR, 266 MHz RAM
- 2 × 18-GB hard disks
- 100 MB network adapter
- Windows Server 2003, Standard Edition
- For deployments in excess of 50 000 users, a 1 GB network adapter is required for the Enterprise Edition Server

Ordering Information

For further information, contact your local Nortel representative.

Nortel Unified Messaging Portfolio

Nortel Messaging solutions incorporate the latest technology and add Web-based graphical user interfaces to bring feature-rich communications to the desktop or mobile device while making message management easy and effective. For any size enterprise, the Nortel Unified Messaging portfolio of products provides unified, personalized messaging to office and mobile or remote workers.

- Nortel CallPilot
- Nortel Unified Messaging 2000
- Nortel Hospitality Messaging Server 400

Nortel CallPilot



Overview

CallPilot is a unified messaging application that combines voice mail, e-mail, and fax to create a personalized, feature-rich communications and message management system. CallPilot incorporates the latest technology, including Speech Activated Messaging (SAM), and e-mail-by-phone, giving users access to messages from mobile e-mail-enabled devices such as Personal Digital Assistants (PDA). CallPilot also provides access to messages using a telephone user interface (TUI) through voice commands or Dual-Tone MultiFrequency (DTMF) tones from anywhere. CallPilot builds on the customer-driven functionality of proven Nortel messaging products and adds Web-based graphical user interfaces (GUI) to make system management easy and effective. The CallPilot portfolio includes Messaging 100/150 (Current Software Release 3.5) for the Nortel Norstar Integrated Communications System, CallPilot Unified Messaging (Current Software Release 3.0) for the Nortel Communication Server 1000 Series, and CallPilot as an integrated version for Business Communications Manager 50 and Business Communications Manager 200/400.

Ideal For

Ideal for small, medium, and large businesses, CallPilot offers a messaging solution for every business need, from a small 20-user Greenfield site to a single CallPilot system that serves a 20 000-user, multi site corporation using IP telephony.

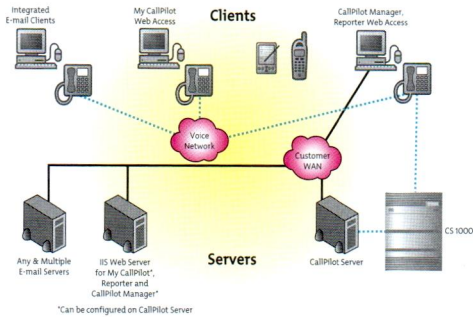
Business Challenges

- Do you use a traditional Nortel Meridian 1 PBX, a Nortel Communication Server 1000M, or a Nortel Communication Server 1000?
- Do you plan to upgrade your voice messaging system?
- Do you often employ temporary or mobile workers?
- Do you need confidential, person-to-person message transmissions?
- Are you interested in ways that you can improve user productivity and reduce administration overhead?

Typical Applications

All employees benefit from implementing CallPilot. Typical applications include head offices and branch offices in the finance, government, health care, and transportation sectors, although many industries use CallPilot. For example, Nortel designed the Nortel Hospitality Messaging Server 400 specifically for the hospitality industry. Productivity enhancements are immediately apparent for businesses with mobile and remote employees. Time spent by stationary desktop users to access messages is less with CallPilot.

Network Diagram



Key Points

- Increased productivity reduces message access time by as much as 50 percent.
- Low cost of ownership with simple management and ongoing maintenance.
- Seamless integration provides a single mailbox for voice and fax messages by pointing and clicking from a desktop PC e-mail client by using a simple Web-browser interface.
- Supports conventional touchtone commands as well as a convenient and easy-to-use speech-activated messaging interface that is ideal for the mobile workforce.
- Includes Web-based and centralized system management tools to maintain low total cost of ownership
- Complies with industry standards to fit with existing IT and telecommunications environments.
- Architecture does not affect your existing e-mail server because of simplified deployment and no single point of message failure.
- Users create caller services such as automated attendants and fax-on-demand quickly and manage caller routing easily.

Features and Benefits

- **Simple to use interface** reduces training and increases productivity and uses the same telephone user interface (TUI) commands as Nortel Meridian Mail to help ensure ease of transition between the two systems.
- **Playback messages** through the PC, Web, or

telephone anytime, anywhere.

- **Digital networking** saves transmission costs.
- **Unified messaging** gives users the ability to merge voice, fax, and e-mail messages into a single interface and is easily integrated with Lotus Notes, Microsoft Outlook and Novell GroupWise.
- **Integrated voice and fax messaging** provides the ability to receive, store, and process voice and fax messages in the same multimedia mailbox to provide a single point of user administration and access.
- **E-mail-by-phone** provides users with access to their e-mail messages from a telephone set so they scan a list of e-mail messages and print messages to a fax machine.
- **Nortel Contact Center integration** supports the Nortel Contact Center (ACCESS voice) service, voice menu, and the voice-processing needs of Nortel Contact Center, allowing CallPilot to be an integrated part of a Nortel Contact Center solution. CallPilot offers the same Nortel Contact Center functionality as previously provided in the Nortel Meridian Mail solution including:
 - Give IVR sends callers to an IVR session and maintains each caller's spot in queue
 - Controlled Broadcast Announcement plays broadcast-type announcements to callers
 - Open Voice Session prompts the caller for information, collects the information, and plays expected wait time messages,
- **My CallPilot** is accessible through a Web

browser and offers users personalized, visual "windows" into the CallPilot system. My CallPilot offers exceptional flexibility to manage messaging needs, including the ability to change the setup of mailbox features, to create personal distribution lists, and to receive, forward, reply to, and send messages through the Web client.

- **CallPilot Manager** is a powerful management application that users configure and maintain from any browser-enabled workstation at the click of a mouse button. Included within CallPilot Manager is CallPilot Reporter, which generates reports about the operation and performance of the CallPilot system.
- **Application Builder** enables administrators to create custom voice menus, automated attendants, and fax-on-demand through a drag-and-drop GUI.
- **Networking** uses voice profile for Internet mail (VPIM) standards to create seamless IP integration with existing communications systems such as Nortel Meridian Mail, Nortel Norstar Integrated Communication System,

and systems from other vendors. The standards based include VPIM, SNMP, LDAP, and IMAP.

- **Alternative user interface** provides an alternative interface that emulates the most commonly used messaging systems (Octel Serenade and Aria) that use dual-tone multifrequency commands.
- **Optional Enhanced Contact Center** provides agent and supervisor features through the Messaging 100/150 and Norstar ICS. These features include intelligent call routing, skills-based routing, activity codes, reporting and real-time displays for up to 100 configured agents.
- **Used across the Nortel Multimedia Communications portfolio**, CallPilot integrates with Nortel Meridian 1 PBX, Nortel Communication Server 1000, Nortel Meridian SL-100, Nortel DMS-100 (CPE Centrex), Nortel Business Communications Manager 50, 200 and 400, and Nortel Norstar Integrated Communications System platforms.

Technical Specifications

Several platform options are available. Each platform offers various levels of capacity, redundancy, and switch connectivity options. The following is a breakdown of each type:

PLATFORM	CallPilot BCM	Messaging 100	Messaging 150
Processor	Intel	Motorola PowerPC 855	Motorola PowerPC 855
Number of Ports	16 VM / 32 Total	4	8
Storage Hours	2000	9	82
Maximum Mailboxes	1000	40	300
Downloadable Greetings	1000	Standard	Standard
Park and Page from Mailbox	Standard	Standard	Standard
Basic Call Center	Standard	Optional	Standard
Call Center Reporting	Optional	Optional	Optional
Centralized Voice Mail	Optional	N/A	Optional

Enhanced Call Center	N/A	N/A	Optional
VPIM/AMIS Networking	Optional	Optional	Optional
Desktop Messaging	Optional	Optional	Standard 2 Seats – additional optional
Connectivity	BCM	Norstar ICS	Standard
Dimensions	N/A	Height: 33 cm (13 in.) Width: 20 cm (8 in.) Depth: 4 cm (1.5 in.)	Height: 33 cm (13 in.) Width: 20 cm (8 in.) Depth: 4 cm (1.5 in.)
Power	ac	ac/dc Adapter (9V dc input)	ac/dc Adapter (9V dc input)

PLATFORM	CallPilot Mini	CallPilot 201i (in skins)	CallPilot 703t (Tower)	CallPilot 1002rp (Rack Mount)	CallPilot 1005r (Rack Mount)
CPU	Motorola PowerPC 855	Celeron 300 Mhz	Dual Intel Pentium II 450 MHz	Dual Intel Pentium III 866 MHz	Dual 3.2 GHz Xeon
Memory	PCMCIA	256 MB	512 MB	512 MB	400 MHz DDR2 SDRAM @ 2 GB
Channels	8	40	96	192	192
Storage Hours	160	350	1200	2400	2400
RAID	No	No	Standard	Standard	Standard
Max UM Clients:	100	2200	12 000	20 000	20 000
Max Voice Mail boxes	200	2200	7 000	15 000	15 000
Max Users	200	10 000	20 000	50 000	50 000
Connectivity	Meridian 1 PBX 11C Cabinet and 11C Chassis	Meridian 1 PBX Portfolio and CS1000 series	Meridian 1 PBX Portfolio and CS1000 series	Meridian 1 PBX Portfolio and CS1000 series, Meridian SL-100, CPE Centrex	Meridian 1 PBX Portfolio and CS1000 series
Protocols Supported	SMTP, IMAP4 OR POP, VPIM, SNMP, LDAP	SMTP, IMAP4 OR POP, VPIM, SNMP, LDAP	SMTP, IMAP4 OR POP, VPIM, SNMP, LDAP	SMTP, IMAP4 OR POP, VPIM, SNMP, LDAP	SMTP, IMAP4 OR POP, VPIM, SNMP, LDAP

Dimensions:	Height: 33 (13 in.) Width: 4 cm (2 in.) Depth: 20 cm (8 in.)	2 IPE Slots	Height: 41.98 cm (16.53 in.) (chassis only) Width: 21.48 cm (8.46 in.) (chassis only) 65.0 cm (25.59 in.) Clearance: front: 25 cm (9.84 in.) rear: 12.7 cm (5 in.) side: 7.62 cm (3 in.) Weight: 22 kg (46 lb) fully loaded	Height: 31.75 cm (12.5 in.) Width: 48.26 cm (19 in.) Depth: (49.53 cm (19.5 in.) (without front bezel) 53.34 cm (21 in.) Weight: 45.5 kg (100 lb) fully loaded	Height: 8.89 cm (3.5 in.) Width: 50.8 cm (20 in.) Depth: 43.54 cm (17.14 in.)
Power:	External Power Supply 115/230V ac nominal; range 100 to 240 V 50/60 Hz nominal; range 47 to 63 Hz	Powered by the media gateway	ac 110 60 Hz / 220V 50 Hz	ac 110 60Hz / 220V DC 50 Hz and 48V DC Hot swappable and fully redundant power supplies	2 x 500 W ac (auto switching 90 to 240v 50/60 Hz) hot swap redundant

Ordering Information

For further information, contact your local Nortel representative.

Nortel Unified Messaging 2000



Overview

Nortel Unified Messaging 2000 is a full-featured, carrier-grade unified messaging product that meets the needs of large, global businesses. Unified Messaging 2000 provides exceptional reliability and scalability as expected from a carrier-grade product. Providing services nearly a million users, Unified Messaging 2000 gives businesses a messaging product that can grow with them. Offered on the Nortel award-winning Media Processing Server (MPS), Unified Messaging 2000 and other advanced speech and video applications can co-reside on a single server so businesses can capitalize on their investment in hardware and software.

Ideal For

Large enterprise and carrier customers that want superior reliability and scalability in their unified messaging solution. Ideal for Global businesses who offer messaging services to multiple tenants (internal or external) and desire a geographic redundant solution. Because Unified Messaging 2000 can work in any vendor telephony or VoIP environment, this application is ideal for a large multivendor customer environment.

Key Points

- unified voice, fax, and e-mail messaging
- scalable reliability up to six nines
- geographic redundancy is an available option for guaranteed high availability
- seamless integration into any telephony environment including SIP/VoIP and TDM
- multiple Directory Numbers (DN) for each mailbox to provide a single messaging system for work, home, and cell phone
- multitenant functionality to provide services to multiple businesses or departments while maintaining separate databases
- highly scalable capacity to support up to one million users
- multiple telephone interfaces available, including Octel Aria emulation and CallPilot or Meridian Mail

Features and Benefits

- A single interface for voice, fax, and e-mail messages that provides improved user productivity by eliminating multiple message access points.
- Works in virtually any e-mail environment and does not affect the e-mail server; voice and fax messages forward as e-mail attachments and are stored separately from the e-mail server.
- Web-based messaging and personal mailbox management gives clients free access to voice, and fax messages and makes unified messaging deployment easy.
- Web-based management and reporting reduces cost of management.
- Speech ready applications to which you can add advanced features at your own pace and create a completely tailored access environment.
- Remote notification to respond to customers and partners quickly.

Ordering Information

For further information, contact your local Nortel representative.

Nortel Hospitality Messaging Server 400



Overview

The Hospitality Messaging Server 400 (HMS 400) replaces the Meridian Mail HVS as the messaging solution for the hospitality industry. It is a global product with multilanguage support. The HMS 400 platform provides ample resources to add additional feature and capabilities. It is scalable up to 7000 users with the choice of single server or multiserver configurations.

Ideal For

Nortel designed the Nortel HMS 400 for enterprise customers that want to deploy a guest messaging application for the hospitality industry. Hotel owners can provide the following services:

- voice messaging for guests and staff
- automated wake up calls with snooze
- housekeeping and room status service
- mini-bar management
- 18 languages

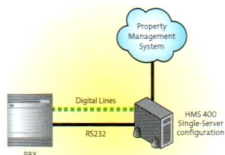
Business Challenges

- Do you want a full featured voice-messaging solution for your hotel guests and staff?
- Do you need a messaging platform that seamlessly integrates with your Property Management System?
- Do you have a large number of guests from other countries?

Typical Applications

Hotels or any hospitality environment interested in providing best in class communications features to their guests.

Network Diagram



Key Points

- **Scalable systems** are configurable from 8 to 40 ports. Clusters as many as three servers to bring port capacity to 120 ports.
- **Voice Messaging** provides easy-to-use Guest voice mail with group-messaging features. These features are effective for tour groups and events business. Voice messaging also offers voice mail or unified messaging for staff members.
- **Auto Wake-up messages** are delivered in the language of the guest's choice (18 languages) and features a snooze capability. The service notifies the front desk if the guest does not answer after three attempts.
- **Housekeeping features** assist hotel staff in updating room status. These features are available in any of the 18 supported languages.
- **Mini-bar feature** is a system for the hotel to post inventory use item charges using the room telephone.

Features and Benefits

The Nortel Hospitality Messaging Server 400 provides many guest features including:

- guest configurable greeting for personalization
- guest configurable pass-code for security
- assignment of guest pass-code through PMS for easy check-in
- automatic Check-in Comfort Message to welcome guests to the hotel
- automatic login and automatic play with no buttons to push
- move guests between rooms and preserve any saved messages from the previous

guests

- guest Group Message Delivery for tour announcements.
- guest Language Set by PMS allows front desk staff to program the guest's preference
- guest Text Message provides alerts for guest
- restore All Deleted Guest Messages (Staff Activated)
- post Check-out Message Retention in case guests forget to collect messages before they leave

The Nortel Hospitality Messaging Server 400 also contains the following system features:

- disk-to-disk back up and restore
- disk-to-tape back up and restore (optional)
- remote maintenance access
- maintenance and Administration format with GUI-based look and feel
- guest administration backup terminal in the event the PMS system is down
- autoattendant services
- time-of-day, day-of-week, and holiday controllers
- system reports
- automatic wake-up reports
- system alarms
- remote notification (DTMF pager)

Market Information

The HMS 400 is a server-based, scalable solution that delivers hotel-specific messaging and other services for the smallest property to the largest resort.

Ordering Information

For further information, contact your local Nortel representative.

Technical Specifications

Dimensions

Height chassis only: 42 cm (16.75 in.) with

chassis feet: 44 cm (17.5 in.)

Width chassis only: 21.5 cm (8.6 in.) with chassis

feet: 32 cm (12.7 in.)

Depth (distance from front to back): 65 cm (26 in.)

Clearance

• Front: 25 cm (10 in.)

• Rear: 12.5 cm (5 in.)

• Side: 7.5 cm (3 in.)

Approximate weight of fully loaded system: 20 kg (46 lb)

Power

ac power supply connector (450 W non-hot-swappable power supply)

Currently Supported On:

- Meridian 1 PBX Portfolio - Release 25.40b or higher
- Communication Server 1000 series release 3.0 or higher

Nortel Contact Center Portfolio

The Nortel Contact Center portfolio of solutions includes end-to-end customer contact centers that deliver complete, seamless customer experiences. An enterprise can start modestly with a single center or ambitiously with a global, multimedia center with thousands of representatives. Products in the Nortel Contact Center portfolio provide various ways to improve customer interactions, such as Computer Telephony Integration (CTI), Outbound, and Multimedia applications. Powerful real-time and historical reporting comes “in the can” or can be created easily with a Report Creation Wizard. New unified browser-based tools are used to manage and operate the complete center from any secure IP connection, in the office or remotely. Nortel Contact Center 6.0 is easy to deploy and operate, powerful, efficient, and cost-effective. Nortel Contact Center portfolio contains:

- Nortel Contact Center 6.0 Suite
- Nortel Contact Center - Manager
- Nortel Contact Center - Multimedia
- Nortel Contact Center - Outbound
- Nortel Communications Control Toolkit
- Nortel Remote Agent Observe
- Nortel Agent Greeting
- Nortel Contact Recording and Nortel Quality Monitoring
- Symposium Express Call Center

Nortel Contact Center 6.0 Suite

Overview

The Contact Center 6.0 suite is a fully integrated suite of contact center solutions that offers a full range of functionalities that covers inbound and outbound voice, multimedia (e-mail and Web collaboration), and computer-telephony integration (CTI). Contact Center 6.0 offers a multimedia-ready agent desktop along with all the supervisor tools to manage multimedia contact center.

Nortel Contact Center 6.0 suite is a single contact center solution that aligns applications formerly known as Symposium-branded applications into a single streamlined offering. Contact Center 6.0 increases contact center efficiency and provides a more effective customer experience regardless of the shape, size, or orientation of your contact center. This industry-leading suite of innovative solutions helps organizations respond quickly and effectively to callers' changing needs. The suite delivers superior call-management capabilities and uses the latest in communications technologies.

The Contact Center Suite 6.0 includes Contact Center Manager (formerly known as Symposium Call Center Server and Web Client), Contact Center - Multimedia (formerly known as Symposium Web Center Portal), Communications Control Toolkit, and Contact Center - Outbound.

Ideal For

The Nortel Contact Center 6.0 suite is ideal for:

- Organizations that need to employ remote agents to work from home, and remote or mobile managers.
- Enterprises that want to capitalize on the expertise of a distributed workforce (Expert Anywhere).
- Enterprises that want to increase contact center efficiency and provide a breakthrough customer experience.
- Contact Centers that want to unify and simplify the agent tools used to respond to all contacts regardless of media type.
- Enterprises that want to reduce system integration costs.
- Enterprises that want to blend outbound and inbound calling.

Business Challenges

The business challenges to consider when deciding to purchase the Nortel Contact Center 6.0 suite are:

- Do you need to increase first time call resolution so that agents can instantly collaborate with an expert anywhere in the organization?
- Do you want to deliver multimedia applications to agents at remote sites or home-based offices without incurring significant costs?
- Do you want to capitalize on the expertise of a

distributed workforce and extend the hours of service your contact center covers?

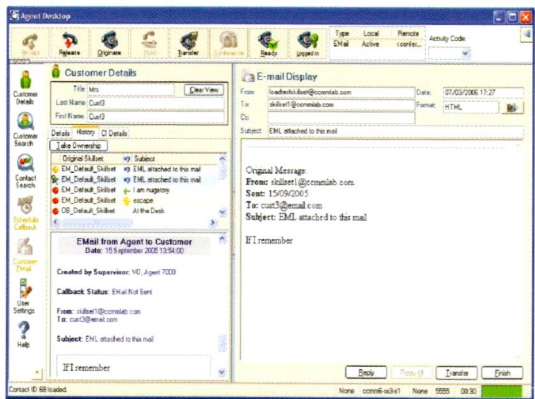
- Do you need to improve the productivity and collaboration of your agents to reduce call hold times and abandoned call rates?

Typical Applications

Examples of typical applications of the Nortel Contact Center 6.0 suite are as follows:

- Contact Center solution that is viable for the 10 to 3350 agent contact center in a single site or multiple site enterprise.
- Organizations with a contact center that runs in TDM, IP, or SIP environments with inbound or outbound voice, e-mail, IM, fax, video, and Web communication.
- Enterprises that want a virtual contact center environment, in which agents are located across multiple sites, at home, in remote offices, or in outsourced overflow call centers.

Network Diagram



Key Points

The key points of the Nortel Contact Center 6.0 suite include:

- Contact Center 6.0 costs less to implement and is easier to manage than nonintegrated solutions.
- The Contact Center suite offers a TDM-, IP-, or SIP-based platform for inbound and outbound voice, e-mail, text chat, fax, and Web collaboration with integrated CTI for an all-in-one solution.
- Outbound Campaign Manager provides the ability to create, change, and monitor outbound campaigns with the sophisticated tools used for inbound calls.
- Improved capabilities to simplify management and increase the effectiveness of the contact center.
- Security enhancements to protect the organization.
- The Contact Center 6.0 Suite consists of integrated applications that provide solutions for basic to complex contact centers.

Features and Benefits

The features and benefits of the Nortel Contact Center 6.0 suite include:

- Open multimedia queue allows skills-based routing, reporting, and management of multiple contact channels (multimedia contact types).

- Integrated Outbound provides a blended contact center with the use of the same real-time displays and historical reporting management tools used for inbound calls.
- Improves agents' effectiveness and productivity to help increase employee satisfaction and retention
- Contact Center Agent Desktop provides a single agent interface to manage inbound, outbound, and multimedia calls.
- Report Creation Wizard allows the agent to generate custom reports without the use of third-party report writers.
- Supervisor enhancements including real-time display and historical reporting options to operate and manage the Contact Center 6.0 Suite of solutions.
- Next-generation SIP functionality supports the Expert Anywhere application.
- Corporate license management reduces ownership costs by centralizing control of software licensing for all elements on a node and all nodes in a network.
- Increased resiliency options with automatic or manual failover that provide a high-availability solution for the Contact Center portfolio applications to reduce unplanned downtime and simplify disaster recovery strategies.
- Universal networking provides network skills-

based routing, reporting, and management of multiple contact centers as a single virtual contact center.

- Integrated multimedia blends inbound and outbound voice, e-mail, Web communications, and fax into one routing and reporting engine to provide a task-oriented context-sensitive agent user interface.
- Reduced system integration costs with Communications Control Toolkit 6.0 to quickly and inexpensively develop desktop and server applications, screen displays, CRM connectors, and more.

Nortel Contact Center - Manager

Nortel Contact Center - Manager (CCM) 6.0 is part of the Nortel Contact Center Manager Server and the Nortel Contact Manager Administration. The CCM is a comprehensive, next-generation solution set that creates a breakthrough customer experience driving first-call resolution and agent productivity while lowering the total cost of ownership.

Contact Center Manager encompasses:

- Contact Center Manager Server (CCMS) offers a scalable solution for dynamic contact centers that require sophisticated, differentiated levels of care offered to their customers. Contact Center Manager Server provides skills-based routing, call treatment flexibility, real time displays, multimedia routing, comprehensive management, and reporting functionality.
- Contact Center Manager Server Utility contains maintenance and monitoring utilities that include user administration, system configuration, Voice Prompt Editor, server backup, system performance monitoring, and alarms and events monitoring.
- Contact Center Standby Server (optional) helps ensure the resiliency of Contact Center Manager Administration.
- Contact Center Manager Network Control Center (optional) manages the Network Skill-Based Routing (NSBR) configuration and communication between servers in a Contact Center Manager network.

Nortel Contact Center - Multimedia

Contact Center - Multimedia (CCMM) is a Microsoft Windows 2000 client/server multimedia contact center application. It offers intelligent e-mail routing, call blending, and the management tools to easily integrate today's Web-based customer inquiries into the dynamic contact center environment. The CCMM improves first-call resolution, reduces contact handling costs, improves staff productivity and morale, preserves full contact center investment including integration to business applications, and reduces cost of deployment and total cost of ownership.

E-mail Manager

The E-mail Manager has the following features:

- Skills-based routing that routes requests to the most qualified agent.
- Advanced scripting capitalizes on the same business routing rules for e-mails and phone calls.
- Preferred Agent Routing that queues to individual agents.
- Priority routing for preferred customers' e-mails.
- Automated responses to frequently asked questions.
- Consolidated e-mail statistics and reporting capabilities.
- Provides customers with an immediate or scheduled agent call-back through a Web-generated request.

Multimedia Manager

The Multimedia Manager has the following features:

- Voice blending allows contact centers to provide skills-based routing for Web requests. This routes all media types, voice and electronic, to the most appropriate contact center agent the first time.
- Single point of administration for skillsets, supervisors, and agents.
- Single Agent Login for Contact Center - Multimedia and Contact Center Manager Server.

Web Communication Manager

The Web Communication Manager has the following features:

- Provides real-time, on-line communication and collaboration between agents and customers.
- Text-Chat supports Web-based agent and customer discussions.
- Bidirectional Page Pushing enables customers and agents to push Web pages that are predefined or created on an as-needed basis to one another.
- Web-on-Hold streams media, such as video, images, and Web pages, to customers' browsers while they are waiting for connection to a live agent.

Nortel Contact Center - Outbound

Nortel Contact Center - Outbound offers more services that expand the addressable contact center market opportunities. Contact centers use outbound campaigns to retain specific customers and to automatically call back customers who tried to call. The outbound

capabilities offer fully blended inbound and outbound environments in a pure voice contact center environment or a multimedia-enabled environment. The Nortel Contact Center-Outbound includes the Outbound Campaign Management Tool (OCMT). The OCMT allows the administrator to create, modify, and monitor outbound campaigns. The OCMT is used to import call lists, create call scripts, and set parameters, such as the start and stop time associated with the campaign.

Nortel Communications Control Toolkit

Communications Control Toolkit 6.0 is the Nortel next-generation unified integration middleware platform for the Communication Server 1000 switch range and MPS 500 and MPS 1000 Self Service platforms (see Nortel Computer Telephony Integration Portfolio in this Guide for details).

Nortel Remote Agent Observe



Overview

Nortel Remote Agent Observe 1.0 delivers a simple, cost-effective solution that adds powerful remote observation and supervisory capabilities through simplified quality assurance activities. These activities allow outsourcers to provide their clients with a flexible monitoring solution. With no equipment at the remote location other than a DTMF-enabled telephone, managers can check the quality of service of agents who provide to customers.

Ideal For

The Nortel Remote Agent Observe 1.0 is an ideal solution for the following:

- Contact centers of any size who want to assure superior quality.
- Service bureau environments that wish to give clients easy access to monitor calls.
- Contact centers using skill-based routing.
- Virtual contact centers where managers need to monitor agents at remote locations.

Business Challenges

The business challenges to consider when deciding to purchase a Nortel Remote Agent Observe 1.0 are:

- Do you want to give your contact center managers expanded observe functionality?
- Do you operate an outsourced service bureau environment where you want to give clients easy and secure access to monitor calls for their businesses?
- Do you have skills-based routing in your contact center and need to monitor calls to ensure a high level of agent ability across multiple skillsets?
- Do you want a simple way to coach agents to improve skills and assure high quality calls?
- Do you want high levels of customer retention and customer loyalty?

Typical Applications

Typical applications of the Nortel Remote Agent Observe 1.0 are as follows:

- Outsourced or service bureau contact centers with clients that need to easily and cost-effectively observe calls from anywhere.
- Any Nortel contact center user who needs to enhance the observe function by adding additional secure access and call recording.

Key Points

The key points of the Nortel Remote Agent Observe 1.0 include:

- **Supervise and observe agents from any location:** Managers on a business trip or working from home can log on by using a secure user ID and password. Clients of outsourced contact centers can observe calls with ease to ensure call quality.
- **Build on a wide variety of observation parameters:** In addition to monitoring position ID, Nortel Contact Center Manager Server users can monitor calls presented to a specific agent ID, skill-set, application, controlled directory number (CDN) or DNIS (dialed number) giving users additional choices and enhanced control over observation.
- **Select supervisor listen and speak options:** Supervisors can switch between listen only mode and listen and speak mode. If necessary, the supervisor can speak to both agent and caller. This ability ensures managers can interact with agents and callers in the manner most appropriate for the situation.
- **Record calls with ease:** In a Nortel Contact Center environment, you can record calls in a standard .au format and save them to an FTP server for future reference. For example, supervisors can review with an agent for coaching to improve skills and enhance quality.
- **Guard against unauthorized access:** Security features ensure only authorized users gain access to the system and can observe calls. Administrators easily manage access control, user profiles and privileges using a Web browser-based interface.
- **Use any phone:** No special equipment is required to observe calls—only a touch tone telephone.

- **Deploy easily in any Nortel contact center environment:** No significant equipment changes are required. Nortel Remote Agent Observe operates on a single-slot media card installed on any Nortel Meridian 1 or Nortel Communication Server 1000 platform.

Features and Benefits

The Nortel Remote Agent Observe offers a single slot digital card solution installed in any IPE slot where an XDLC can be installed. Large systems as many as three Nortel Remote Agent Observe cards and can scale to as many as 16 ports (16 concurrent observations sessions). The Nortel Remote Agent Observe package contains two ports (two concurrent observation sessions), which is the minimal order for a new Nortel Remote Agent Observe system.

The features of the Nortel Remote Agent Observe 1.0 include:

- **Remote Observe:** enables contact center supervisors and other business leaders to monitor the quality of customer service from almost anywhere, including remote or offsite locations.
- **Observation parameters flexibility:** provides users with a number of choices for remote monitoring of contact center activities, such as position ID, agent, skill-set, CDN, or DNIS.
- **Supervisor listen and speak options:** supervisors can listen only or listen and

speak to coach agents or directly assist callers.

- **Call recording capability:** records calls and exports them to an FTP server in .wav format so they can easily be accessed later for reference or training purposes.
- **Access security:** uses unique user IDs and passwords to ensure access by only authorized users. Administrators can control access, user profiles, and privileges.
- **Reporting:** delivers a log that tracks observed call activity.
- **Web-based administration interface:** administrators can control the observation parameters.

The Nortel Remote Agent Observe delivers a simple, cost-effective solution with powerful remote observe and supervision capabilities. This product helps simplify quality assurance activities and enables outsourcers to provide a flexible monitoring solution to their clients.

Market Information

Nortel Remote Agent Observe is perfect for any contact center that needs a simple, effective way to monitor conversations between agents and callers from anywhere without installing expensive remote locations. This requirement is imperative for service bureaus, outsourcers, and any geographically dispersed contact center.

Ordering Information

For further information, contact your local Nortel representative.

Nortel Agent Greeting



Overview

Nortel Agent Greeting 3.0 is a versatile solution that improves customer satisfaction while boosting agent productivity. Nortel Agent Greeting is a simple, cost-effective, and easy-to-use solution that enables contact center agents to prerecord standard or multiple greetings. Before the agent handles a live call, each customer hears a recorded greeting. Agents in high-volume contact centers need not repeat the same greeting during their shifts. Likewise, contact center agents who answer their calls with multiple and unique greetings depending on the customers have a few extra seconds to transition from one call to the next. This helps ensure the agent is prepared to give each caller attentive and superior service.

Ideal For

The Nortel Agent Greeting is ideal for the following:

- Medium to large contact centers with medium to high inbound call volumes.
- Service bureau environments.
- Contact centers with skill-based routing.
- Multilingual contact centers where regional or cultural distinctions are business requirements.
- Any users of Nortel Meridian 1 or Nortel Communication Server 1000 contact centers, including Nortel Contact Center Manager Server, Symposium Express Call Center, and Nortel Meridian ACD.
- Compatible with any version of Nortel Contact Center Manager Server and Symposium Express Call Center and also compatible with Nortel Communication Server 1000 release 2.0 or higher.

Business Challenges

The business challenges to consider when deciding to purchase the Nortel Agent Greeting are:

- Do you want your contact center agents freed from repeating a standard greeting for each call?
- Do you have agents who answer calls for multiple skill sets or languages and need to be greet customers differently?
- Do you operate an outsourced service bureau environment where agents handle calls from multiple accounts?
- Do your agents work in a contact center that handles more than 300 calls per day?
- Do your agents tire of repeating the standard greeting, which results in flat and unwelcoming greetings by the end of the day?

- Do you want innovative ways to increase agent satisfaction and retention to save on training and recruitment costs?
- Do you want high levels of customer retention and customer loyalty?

Typical Applications

The typical applications of the Nortel Remote Agent include:

- High volume contact centers with short call times such as taxi bookings and paging companies.
- Simple or sophisticated contact center where agents handle at least 300 calls daily where you can see instantly the benefit in using this robust and scalable solution.
- Contact centers with a large skill mix, languages, or service offering—a combination that requires different greetings depending on call type.
- Service bureau or outsourced contact centers where agents handle a variety of client calls.
- Any contact center where flat, monotonous greetings occur at the end of a long, busy day, thereby affecting agent morale and customer relationships. Agent satisfaction is an ongoing challenge for today's dynamic contact centers as both call volume and callers who have unique and often varied needs are increasingly challenging agents.
- Nortel Agent Greeting is useful in any contact center where retaining the best and brightest talent is critical.

Key Points

The key points of the Nortel Agent Greeting include:

- **Increases agent satisfaction:** Nortel Agent Greeting makes agents' jobs easy by giving

them extra time to transition between calls and eliminating the repetitive or mundane task of repeating standard greetings during their shifts.

- **Improves agent retention and reduces costs:** Satisfied agents with high morale are likely to stay in their jobs longer, thereby improving agent retention and reducing costs associated with training and recruiting.
- **Reduces the physical demands on agents' voices:** Standard and consistent greetings are heard by the customer regardless of the agent's mood or time of day. This enhanced greeting quality results in improved customer service.
- **Enhances greeting quality:** Agent effectiveness and customer service are improved; improved call quality leads to customer loyalty.
- **Improves customer service:** Agents have a few extra seconds to transition from one call to the next so they are well prepared to give each customer their undivided attention.
- **Enhances customer loyalty:** High agent satisfaction and improved agent retention have a positive effect on customer satisfaction levels and ultimately customer loyalty as customers establish and grow relationships with a company.
- **Reduces noise levels:** Agents are actually speaking less, thus reducing the contact center noise level and minimizing the distraction of background noise for both customers and agents.
- **Offers ease of use:** Nortel Agent Greeting is easy to use for both agents and supervisors and because it is easy to use. In real-time, high-volume contact centers ease of use is a primary requirement.
- **Provides a robust and scalable solution:** This solution meets high inbound (300 or more calls daily) and sophisticated contact center requirements.

Features and Benefits

The Nortel Agent Greeting card along with required extra conference capacity provides the functionality required to implement the Nortel

Agent Greeting feature. The Nortel Agent Greeting card appears to the Nortel Meridian 1 as an extended digital line card (XDLC) with as many as 32 sets attached. These virtual sets are configured as Nortel Meridian modular M2616 sets. Only 24 ports are used for the Nortel Agent Greeting application as each Nortel Meridian set must have an associated digital signal processors (DSP) port. The extra conference resources are required to conference the incoming call to the Nortel Agent Greeting port during the greeting.

- Enables agents to easily prerecord standard greetings.
- Supports agent and skill set specific greetings for Nortel Contact Center Manager Server or Symposium Express Call Center environments.
- Supports agent-specific greetings for Nortel Meridian ACD environments.
- Provides visual key flash and conferenced greeting.
- Offers Web-based interface for Nortel Agent Greeting card OAM.
- Supports remote loadware and DSP firmware upgrade over IP network.
- Supports 24 greeting ports per card—up to 72 ports total.
- Supports up to 1200 configured agents in a multiscard environment.
- Emulates XDLC (Nortel M2616 Aries set).
- Offers tight integration with the Nortel Meridian 1/Communication Server 1000 that speeds information flow by minimizing delays in processing calls and taking messages.
- Delivers telephony-class, high-reliability design, which reduces possible system outages.
- Includes security features to reduce the chance of fraud and theft of intellectual property.



Market Information

Nortel Agent Greeting is ideal for any medium to large contact center with high inbound call volumes who want to alleviate the repetitive and sometimes confusing task of having to repeat standard or unique greetings for each call. Nortel Agent Greeting is an excellent solution for outsourced or service bureau environments where agents handle calls from multiple accounts, as well as multilingual or multicultural contact centers where language, regional, and cultural distinctions are business requirements.

Ordering Information

For further information, contact your local Nortel representative.

Nortel Contact Recording and Nortel Quality Monitoring

Overview

Nortel Contact Recording and Quality Monitoring products are the latest additions to the Nortel Contact Center portfolio. These products provide increased integration for customers that need Contact Recording or Quality Monitoring products in a Communications Server 1000 environment. Nortel Contact Recording 6.0 is available in both contact center and knowledge worker environments to provide a solution for customers who want a bulk-voice recording solution. Nortel Quality Monitoring 6.0 is available in contact center environments for customers who want to maximize agent productivity and improve business processes using a structured evaluation process based on a sample of calls.

Ideal For

The Nortel Contact Recording and Quality Monitoring products are ideal for the following:

- Organizations that want to upgrade or migrate to IP.
- Clients that want total call recording as well as Quality Monitoring.
- Any industry with compliance, regulatory, 100-percent call-analysis needs such as finance, banking, sales verification, insurance, and health care.
- Organizations that record customer calls selectively or record all contact center calls.
- Businesses that want to improve efficiency and quickly resolve disputes by providing a trail of verbal commitments.
- Organizations that want to improve agent performance with a focus on training specific areas of good and poor agent practices within the contact center.

Business Challenges

The business challenges to consider when deciding to purchase the Nortel Contact Recording and Quality Monitoring products are:

- Does your organization have to meet regulatory recording requirements?
- Does your business strive to improve the quality of service it provides to its customers?
- Does your company need to rely on conversations to complete business transactions?
- Does your organization want innovative ways to train inexperienced agents on best practices using the best agents within its

contact center?

- Does your company want to gain valuable insight into how its processes work?
- Does your company want to increase customer satisfaction and improve staff retention?
- Does your company want to learn what your customers say about your competitors?
- Does your organization need to provide long-term storage of recorded calls?

Typical Applications

Examples of typical applications of the Nortel Contact Recording and Quality Monitoring products are as follows:

- Organizations that rely on customer comments to improve the quality of service.
- Businesses that rely on confirmation of a verbal agreement to speed up transactions and to reduce paperwork.
- Organizations that need audit trails for dispute resolution.
- Businesses where the contact center agents are at risk of receiving threatening or abusive calls.

Key Points

The key points of the Nortel Contact Recording and Quality Monitoring products include:

- **Improves agent skills:** Workflow analysis provides training content development that allows contact centers to model best practices for better efficiency.
- **Increases productivity:** Supervisors spend less time reviewing and accessing agent contacts with the automated quality

monitoring and streamlined contact scoring.

- **Reduces risk:** Recordings confirm transactions processed that reduce business write-offs.
- **Increases revenue:** Repeat business driven by customer satisfaction improvements and modeling successful agents.

Features and Benefits

Nortel designed its Contact Recording and Quality Monitoring product for organizations that need bulk or selective recording for either compliance, risk reduction, fraud prevention, business verification, business optimization, or quality monitoring.

Nortel Contact Recording provides:

- Improved customer interaction recording that supports voice recording and coordinated computer desktop capture.
- Independent data infrastructure functionality such as port mirroring.
- The ability to record traditional digital handsets.
- The ability to make recording decisions in real time based on configurations.
- The ability to administer and support the recording process locally or at an enterprise level.

Nortel Quality Monitoring provides:

- The ability to gauge the contact center's performance, identify trends and opportunities, and streamline processes.
- Enhanced quality of service delivery to customers through continual performance improvement.
- Effective and objective interaction recordings are captured during the replay of synchronized voice and desktop recording.
- The ability for agents to organize recorded interactions by category.
- The ability to evaluate and analyze agent performance with the use of customizable evaluation forms.

Market Information

Nortel Contact Recording and Quality Monitoring empower organizations to improve the performance of contact centers and provide customers with the best service across all media. Businesses have an integrated, closed-loop system for continuous improvement in the contact center with the Nortel Contact Recording and Quality Monitoring. Businesses can record customer interactions including screen activity and evaluate agent performance, and then use those evaluations to prioritize and deliver targeted training.

Ordering Information

For further information, contact your local Nortel representative.

Nortel Symposium Express Call Center



Overview

Nortel Symposium Express Call Center combines sophisticated, skill-based call routing, call treatment flexibility, and intuitive management tools to deliver fast services and increased productivity to department-level or small to medium enterprise customer contact centers with up to 150 active agents. Symposium Express Call Center provides functionality that is usually available only in complex systems, yet is comprehensive in scope and remarkably easy to use.

Ideal For

- Small, medium and large enterprises with small formal contact centers.
- Department contact centers such as help desks, sales desks, customer service centers, and corporate branch offices.
- Any business or organization where five or more people frequently use the phone for incoming calls.
- Businesses or organizations that currently use hunt groups or basic ACD and require increased control.
- Organizations that currently have no contact center and that require an easy-to-use system.

Business Challenges

- Do you have several people answering calls in a reservations office, at an order desk, or at a technical help desk?
- Do you require an environment designed to process calls with efficiency to maximize customer satisfaction?
- Do you require instant updates on call status and the ability to measure, report, and improve your customer call handling using off-the-shelf reporting tools?
- Do you need sophisticated technology, such as skills-based routing and location-independent working to support a contact center function?
- Do you want a solution to support new ways of doing business, such as using CTI applications and screen displays?
- Do you require sophisticated contact center functionality that is quick and easy to use, with a low cost of ownership?

Typical Applications

- Small to medium call centers or internal helpdesks can benefit from the relatively simple-to-manage call-flow configuration and sophisticated features such as skills-based routing.
- Environments that require flexibility in caller treatment and reporting balanced with ease of management, such as:
 - customer care lines
 - sales lines
 - technical assistance
 - employee helpdesks

Key Points

- Grows as business requirements grow.
- Handles as many as 150 active agents (with up to 300 profiles).
- Wizard-driven interfaces to management functions.
- Easy to use with minimal training.
- Low cost of ownership.
- Provides excellent customer service, the same as a large contact center.
- Increases productivity through efficient use of staff resources.
- Skills-based routing supporting up to 50 skillsets.
- Rich and comprehensive historical management reports.
- Graphical or text-based real-time information.
- Supervisor view of contact center and agent activity with real-time display of information.
- Open interfaces to data access and easy integration.
- Integration with third-party applications.
- Software-only solution running on specified

industry-standard PC platforms.

- A flexible and easy upgrade path provides a smooth stepping stone to Nortel Contact Center Manager to retain investment spent in software, training, and management.

Features and Benefits

Symposium Express Call Center uses a predefined decision tree and customer-defined parameters for call routing to determine incoming call queuing and treatments. Queuing and treatments are based on call type and current contact center conditions.

Contact center conditions include:

- open or closed
- emergency status (active or inactive)
- the number of calls active and queued in the system
- the number of calls waiting of a particular type
- the amount of time a call waited in queue.

During open hours, depending on the configuration, queued calls are presented immediately with a greeting announcement and up to two separate delay announcements (independent timers) while the customer is waiting.

The first announcement can inform callers of expected wait time or their position in the queue. Additionally, based on conditions and configuration, calls can be queued to alternative skillsets or sent to an alternative directory number to facilitate answering. During designated closed periods, calls can be queued to an alternative skill-

set, routed to an alternative number for handling or messaging, or assigned a closed announcement. Symposium Express Call Center Release 4.2 runs on Windows 2000 server O/S. It can also run on Microsoft Windows 2003 server operating system. The client, running on Windows 2000 or XP, supports multiple languages. Symposium Express Call Center works with all Nortel Meridian 1 and Nortel Communication Server 1000 platforms.

Nortel Contact Center Manager Server and Symposium Express Call Center both offer skill-based routing to agents, call treatment options, real-time displays and comprehensive management and reporting functionality to empower today's contact centers with the tools and agility to deliver unique and unprecedented customer care. Determining the best solution for a particular situation requires an assessment of not only size and capacity requirements, but an understanding of immediate and future business requirements for capacity, flexibility, and customization to plan incoming call routing and treatment. The following table summarizes the key features of Nortel Symposium Express Call Center and Nortel Contact Center Manager Server to help understand the capabilities of each. (For specific information, see the associated technical documentation.)

	Symposium Express Call Center 4.2	Nortel Contact Center 6.0
Contact center	Emerging and small, departmental	Seasoned and small to large
Requirements	Basic, ease of management	Customizable, dynamic
Capacity		
Calls per hour	5000	66 000
Active agents (A) - (C)	(A) 10 to 150 - (C) 300	(A) 20 to 33 nodal, 100 000 networked
Total skillsets/per agent/ agent priority	100/50/1 to 4	1 000/100/1 to 48

Administration		
Management interface	Wizard-driven, point and click	Uses scripting language
Script customization	No – defined template	Yes
Scheduled changes	No	Yes
Standby mode for skill sets	No	Yes
Routing and treatment		
Idle agent queuing: selection of highest priority idle agent to receive call	Preset: longest idle since last status change	Configurable: longest idle time since last status change, or last serviced or most cumulative idle time this login
Call queuing/treatment decision mechanism	System-wide decision tree	Individual script instructions, or using host data exchange
Call treatment classes	32 per system, one applied per call	Customizable in script
Conditions/intrinsics assessed	Per call treatment class, 6 conditions	Per script, combinations
Time/day/date/holiday	Open or closed treatment	Customizable
Call volume in system – threshold	Unable to handle call treatment	Customizable
Call volume by call type – threshold	Unable to handle call treatment	Customizable
Calls waiting, or age of call – threshold	First overflow treatment	Customizable
Calls waiting, or age of call – threshold	Second overflow treatment	Customizable
Call waiting timers (separate)	Wait announcement treatment	Customizable
Skillset/agent intrinsics (13)	No	Customizable
Traffic volume – call rate	No	Customizable
Uses mathematical calculations	No	Customizable
Emergency state	System-wide treatment	Customizable
Announcements		
Emergency announcement	1 per system	Customizable
Unable to handle call announcement	1 per call treatment	Customizable
Greeting announcement	1 per call treatment	Customizable
Wait announcements	2 separate per call treatment	Customizable

Position in queue/ expected wait time	At first wait announcement	Customizable
Closed announcement	1 per call treatment	Customizable
Management reporting*		
Standard reports – customizable	64 – Yes	120+ – Yes
Call-by-call reporting	No	Yes
RT displays, customizable – personal	3 – No – No	6 – Yes – Yes

* Nortel Contact Center Manager Server also offers the option to use Nortel Symposium Thin Client as the management and administration tool.

Market Information

Small contact centers typically require the same functionality as large contact centers. Nortel Symposium Express Call Center offers a solution for the small contact center with almost the same large solution capabilities as Nortel Contact

Center Manager Server. Competing solutions in the marketplace try either to scale down their large solution or offer a small contact center solution that lacks critical functionality. The primary difference for small contact centers is the need for a simple, all-in-one solution—Nortel Symposium Express Call Center meets this requirement.

Technical Specifications

Minimum Hardware Specifications for Symposium Express Call Center

Processor	Minimum Processor Type 500 MHz Pentium III (Windows 2000 Server); or 733 MHz Pentium III (Windows Server 2003)
Supported Processors	Pentium III, Pentium IV, Intel Xeon, Intel Xeon DP Note: SECC can operate on a single or dual processor (quad processor not supported)
Memory	Minimum 256 MB
Hard Drive	Minimum 9 GB (12 recommended) – Manufacture specification of 7200 rpm speed
Monitor	SVGA with minimum display setting of 1 024 x 768
Keyboard and Mouse	Standard
CD ROM Drive	Minimum of 4x speed
Floppy Drive	8.9 cm (3.5 in.) (must be drive a:)
Modem	Serial or USB that is V32 or V32bis-compliant with minimum 28.8 K baud rate
Backup System	Tape Drive or Remote Directory
Interface Card	10Base-T network Interface card for connection to the ELAN (Optional) NIC for connection to the CLAN (can be Ethernet or Token Ring)

Ordering Information

For further information, contact your local Nortel representative.

Nortel Self-service Portfolio

Enterprises that want to engage their customers with 24-hours-a-day, 7-days-a-week personalized service turn to the Nortel Self-service portfolio products. Nortel Media Processing Servers and the Nortel Voice Processing series and information server help the enterprise to increase customer satisfaction while decreasing operating costs through effective customer contact centers. The Self-service products provide opportunities to expand into new growing businesses such as packaged applications and voice tools. The Self-service portfolio products employ the most advanced speech recognition capabilities available. These solutions expand easily for today and accommodate the future while protecting the investment of an enterprise. The Nortel Self-service portfolio includes the following products:

- Nortel Media Processing Server MPS 500
 - Nortel Natural Speech Navigator
- Nortel Media Processing Server MPS 1000
 - Nortel Natural Speech Navigator
- Nortel Speech Server
- Nortel Web-Centric Self-Service
- Nortel Corporate Directory Dialer
- Nortel Communications Control Toolkit

Nortel Media Processing Server 500



Overview

The Nortel Media Processing Server (MPS) 500 brings the power of video and the internet to self-service and contact center environments. The MPS 500 uses industry open standards in software and hardware. Nortel takes these standards one step further with the MPS 500 to provide a scalable platform that sets superior standards for reliability in a complete Contact Center solution.

The MPS offers the user choices in telephony protocols, programming languages, hardware, and operating systems. It can work with any PBX to provide multimedia, superior speech processing including natural language recognition, verification or authentication, multiple languages, and Text To Speech. The MPS is recognized as the leader in speech-enabled platform implementations by Nuance. The Nortel Natural Speech Navigator, a packaged application, (powered by Nuance Open Call Steering) takes this platform one step further than others can by enabling callers to get help on the first call, whether through automation or using the Nortel Expert Anywhere Solution. Designed for the enterprise MPS 500 ranges from 24 to 192 digital or 240 VoIP ports in a single system, yet cost effectively handles many more ports by connecting multiple MPS into a single solution. MPS 500 also outperforms in hosted environments.

MPS 500 supports VoiceXML, CCXML, and SSXML. This full-featured solution allows the creation of sophisticated self-service applications combining our proven award-winning speech portfolio with virtually limitless data resources of the Web. These technologies allow customers to say what they want naturally and provide multiple pieces of information in a single phrase to simplify the navigation process. Call Protect along with the N+1 Application Processor keeps the customer connected even if a failure occurs in the network. Because MPS 500 uses Windows Standard Server 2003, Windows XP, or Solaris 10, customers can choose the operating system that best suits their infrastructure. The open system architecture and design supports traditional TDM or IP environments or both on the same system.

Ideal for

Nortel Media Processing Server 500 is the ideal self-service solution for small- to medium-sized contact centers and small service providers that want to:

- Provide customers with access to their services 24-hours-a-day, 7-days-a-week.
- Eliminate aggravation, wasted time, and delays by providing information to callers without the need for them to wait in a queue to speak to an agent.
- Increase revenues and save costs by providing new and extra services in response to the ever-changing needs of their customers.
- Provide fast, friendly self-service through speech-enabled applications.
- Invest in a self-service solution that meets today's needs while providing a graceful migration to advanced capabilities in the future.

Business Challenges

- Are you losing revenue because callers disconnect while they wait in the queue to

speak to your agents?

- Do you need to offer your customers multiple channels into your business?
- Do you need to offer your customers new services that keep you ahead of your competitors?
- Are your Interactive Voice Response (IVR) menus difficult to navigate?
- Do you need to extend your business hours but cannot hire additional staff?
- Do you need to reduce network costs?
- Do you need to improve your agent retention rates?
- Do you need to increase the volume of business transactions that go through your contact center?

Typical Applications

- The Nortel MPS 500 is a comprehensive self-service solution for medium to large businesses that need to handle a high call volume without adding staff, and reduce abandoned calls rate, thus increasing revenue and customer

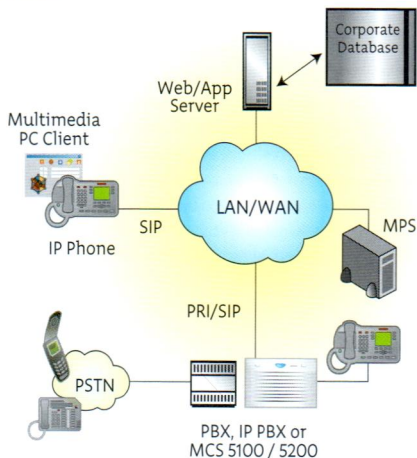
satisfaction.

- The Nortel MPS 500 is the right solution to increase contact center efficiency. By automating many simple and some complex transactions, the MPS 500 alleviates agents of routine tasks to boost agent productivity and morale, thereby increasing contact center efficiency and reducing the employee turnover rate.
- The Nortel MPS 500 can increase revenue and reduce costs by reducing the number of calls that wait in a queue by processing transactions faster than an agent can handle

them, by reducing toll charges and other network costs, and by increasing customer satisfaction.

- The Nortel MPS 500 supports voice over Internet Protocol (VoIP) so you can run voice traffic across your data network for further cost reduction.
- The Nortel MPS 500 gives your customers an alternative channel to your contact center and provides 24-hour-a-day, 7-day-a-week access to your business.

Network Diagram



Key Points

- Improve contact center efficiency by automating routine requests and freeing agents for complex inquiries.
- Deliver friendly self-service and personalized customer experience through versatile, multilingual advanced speech capabilities.
- Extend Web applications to callers by using VoiceXML, Java, and other Internet programs.
- Integrate MPS 500 easily into your existing infrastructure by supporting a wide variety of networking and computing protocols without costly re-engineering expenses.

- Support a hybrid environment of traditional and VoIP telephony protocols that enables a smooth transition to VoIP without costly hardware upgrades.
- Expand the size and capability easily so you can buy what you need today while accommodating future growth and protecting your enterprise investment.
- Streamline system configuration and management with an intuitive Web-based suite of tools to reduce operating costs.

Features and Benefits

- **Digital and IP telephony in a hybrid environment** scales from 24 to 192 T1 or 30

to 240 E1 digital ports or 240 VoIP channels, or a combination digital and IP. This enables enterprises to migrate to VoIP in phases, fitting the business IP telephony strategy without costly upgrades. It also reduces capital and operating expenses by enabling voice and data communications in a single network.

- **Basic self-service through dual-tone multifrequency (DTMF) digit collection** responds to menu options that callers select by using their telephone keypads. This service offers callers many benefits. The service enables an organization to offer 24-hours-a-day, 7-days-a-week access to the business and relieve agents of routine tasks to boost productivity and morale, increasing contact center efficiency and reducing employee turnover rate. Customer contact is personalized by routing calls to the suitable applications, thus increasing customer satisfaction and reducing call duration, which in turn lowers network costs. During peak call-volume periods, the Nortel MPS 500 enables handling of more calls without extra staff and reduces abandoned call rate, consequently increasing revenue and customer satisfaction.
- **Advanced speech recognition** supports speech-enabled self-service solutions. Businesses use these solutions to promote the corporate brand and provide callers with the same friendly customer experience that they expect when dealing with a human agent. Advanced speech recognition reduces the number of calls that customer representatives handle, increases overall system operating efficiency, and dramatically strengthens customer offerings by linking customers directly to a business. Communicating using speech rather than touch-tone input creates a natural flow for users that can increase their levels of comfort when using the service. The easier and faster self-service is, the more readily people will use it. Businesses reduce operating costs because agents spend less time on each call, and the average length of each call is shorter. Speech recognition capabilities supported include large vocabulary recognition (LVR), natural language understanding (NLU), speaker

verification, and text-to-speech (TTS) conversion.

- **Automated fax enables** facsimile (fax) transmissions, such as parts lists, application forms, registration, claim forms, and confirmations through an IVR application. This automated fax capability reduces contact center costs and increases efficiency by reducing the need for human agents to intervene.
- **Strong VoiceXML application development environment** the Nortel implementation of VoiceXML complies with version 2.0 of the VoiceXML specification. The Nortel MPS 500 incorporates a VoiceXML browser that executes voice dialogues that Web servers create. The Nortel MPS VoiceXML browser is a client-tier component that runs on the Nortel MPS 500 platform. Nortel MPS Developer applications use visual icons that make it easy to understand how they work and easy to change them. Nortel MPS Developer also supports capabilities that the VoiceXML specification currently does not address such as preanswer processing and SS7/C7 integration. Developers familiar with XML-based markup languages can find VoiceXML comfortable to use, especially if the data to support transactions comes from Web servers.

Nortel continues to support applications developed with MPS Developer to provide a dual application development environment if required. This development environment offers options to launch previous applications written using the intuitive, graphical development environment of Nortel MPS Developer (formerly known as PeriProducer) or the text-based markup language of VoiceXML. Either application format can be launched from the other make all existing applications current with the latest in design tools.

- **Multiple host and database access** supports the simultaneous connection to current and legacy systems, improving customer satisfaction by providing access to necessary databases to deliver prioritized services to customers. The Nortel MPS 500 easily integrates into existing data and network

infrastructures without costly re-engineering expenses, resulting in reduced integration costs.

- **Computer telephony integration (CTI)**

helps agents deliver fast, tailored customer service. A pop-up window displays a caller's history and account information before an agent answers a call. Computer telephony integration automatically retrieves the relevant database records for the caller. Agents using CTI benefit from an expanded skill set so that customers can speak with any agent. With CTI, agents can sell related products and services or an upscaled version of a product or service to the existing customer base. The Nortel MPS 500 seamlessly integrates with complementary systems to accelerate deployment, simplify system integration, and deliver fast return on investment. Using standard "out-of-the-box" integration packages, Nortel MPS 500 can:

- Pass information to other vendor-PBX systems for fast, intelligent call routing and a superior customer experience.
- Receive automatic number identification (ANI) or dialed number identification service (DNIS) from a Nortel Meridian 1 PBX. The MPS 500 uses that information to transfer digital calls and activate ports for efficient use of IVR and switch resources, thus saving seconds on each call and reducing network costs.
- Pass caller-entered data to a Nortel Contact Center Server to route calls to the suitable agents, help agents provide more personalized service, and deliver specialized caller care.
- Pass caller-entered data to a telephony application-programming interface (TAPI) server to populate agent screen pops to help agents avoid redundant questions, process requests more efficiently, and provide better service.

- **Centralized system maintenance and administration** supports administration and application development through award-winning GUI tools. The Nortel MPS Manager is a software tool used for Nortel Media Processing Server 500 administration,

operation, and control. Nortel MPS Manager runs as a Java client or in an industry-standard browser window. The MPS Manager streamlines configuration and management with an intuitive browser-based toolset, thus reducing operating costs.

- **Nortel Natural Speech Navigator powered by Nuance Open Call Steering** is new to the Nortel Speech portfolio. Callers want an intuitive and simple experience when using self-service applications. They want to benefit from a single prompt from which all destinations can be reached and eliminate the challenge presented by complex menu trees. Nortel Natural Speech Navigator allows callers to focus on speaking their requests instead of navigating menus, which is where many customer calls drop. Callers are promptly directed to the appropriate expert, regardless of whether this is another self-service application, a contact center agent or other knowledge worker. The result is a greatly enhanced caller experience.

Market Information

Nortel ranks number one in several IVR industry analyst reports. Unlike the new competitors in this market segment, Nortel has held a leadership position in the business for more than 30 years and understands contact centers and what it takes to deliver complex self-service applications. Nortel has a large research and development organization of dedicated engineers. Many Nortel competitors offer only the IVR solution. Nortel provides the full portfolio including Nortel Professional Services Organization (PSO). Nortel has a clear evolutionary path from the Nortel Voice Processing series (VPS) to the Nortel MPS; and within Nortel MPS, from traditional telephony to VoIP, from traditional application development to VoiceXML, and from basic self-service to speech-enabled applications. The Nortel portfolio affords organizations a single point of contact for all their communications needs and few issues with integration. Solaris and Windows platforms support integration of the MPS 500 and it fits into existing voice and data infrastructures with no need to re-engineer the network.

Technical Specifications

Configurations	MPS 500 is available in a variety of configurations engineered by Nortel to best fit individual business requirements: Desktop - The desktop configuration is for dual-tone, multifrequency (DTMF) systems. Cabinet - A cabinet configuration is for Speech systems based on IBM Servers for Speech applications. Cabinets can house DTMF systems as well. Rack mount - A rack-mount configuration has the same components as a cabinet configuration, but instead of housing those components in a cabinet, the customer supplies a suitable rack.
Capacity	8 spans for a maximum of 192 T1 ports, 240 E1 ports 240 VoIP channels, or a combination of T1/VoIP or E1/VoIP. Multiple MPS 500 systems can be networked to increase capacity.
Operating System	Choice of Solaris or Windows.
Application Processors	Desktop configurations typically use Sun Blade 150. Cabinet and rack-mount configurations use Sun Fire V120 or V210. Sun Fire V120, V210, V240, Blade 150, Netra 240 (No Axi, AXmp, or Ultra 5 ws) are Solaris supported servers.
OSCAR 6.0 Speech Servers	MPS 500 provides support for Speech Recognition and text-to-speech conversion using the Speech Server platform that runs on IBM X330, X335, X336 Blade Centers, and HP DL360-G4 Window- based servers. Each server has dual 10/100 Mb/s Ethernet and internal management hardware to assist in remote maintenance.
Telephony protocols and standards supported	T1, E1, ISDN, C7/SS7, H.323, SIP
Physical dimensions	MPS 500 Stand-alone Module Height: 9.80 cm (3.86 in.) Width: 44.88 cm (17.67 in.) Depth: 43.18 cm (17 in.) Weight: 9 kg (20 lb) Clearances: 12.7 cm (5 in.) front and rear MPS 500 25-rack units (RU) Cabinet The 25-RU cabinet contains all equipment for 192/240 IVR ports. This self-contained configuration contains all equipment required to monitor and maintain the system. An external Nortel MPS Manager workstation handles remote monitoring. Height: 131.8 cm (51.9 in.) Width: 61 cm (24 in.) Depth: 91.5 cm (36 in.), 102 cm (40 in.) with base Weight MPS equipment: 295 kg (650 lb) Footprint: 55 sq cm (6 sq ft); 62 sq cm (6.7 sq ft) with base) (62 with base) Clearances: 76 cm (30 in.) front and rear

Ordering Information

For further information, contact your local Nortel representative.

Nortel Media Processing Server 1000



Overview

The Nortel Media Processing Server 1000 (MPS 1000) platform brings the power of video and the internet to self-service and the contact center by providing reliability that delivers protection against loss of service at a level acceptable to a carrier. The MPS 1000 has proven success in many deployments at many carriers around the world.

The MPS 1000 system uses industry open standards in software and hardware. Nortel takes these standards one step further with the MPS 1000 to provide a scalable platform that sets superior standards for reliability in a complete Contact Center or hosted solution. MPS 1000 is the best probable fit for Carrier business because it support carrier signaling protocols, such as ISDN, SS7, SIP, ANSI, ETSI, Telecordia, Basic ISUP, TCAP, and INAP. It uses carrier-grade application servers, Speech Servers (DC version), and carrier-grade cabinets with top and bottom cable egress and concrete floor bolts. This makes the MPS 1000 compatible with central office environmental requirements for - 48V dc, GR63 Zone 4 compliance, and Earthquake bracing.

The Media Processing Server offers the user choices in telephony protocols, programming languages, hardware, and operating systems. MPS 1000 can work with any PBX to provide multimedia, superior speech processing including natural language recognition, verification or authentication, multiple languages, and Text To Speech. The MPS 1000 is recognized as the leader in speech-enabled platform implementations by Nuance. Nortel Natural Speech Navigator (powered by Nuance Open Call Steering) takes this platform one step further than others can by enabling callers to get help on the first call, whether through automation or using Nortel Expert Anywhere Solution.

The Nortel MPS 1000 is ideal for delivering a wide range of effective, dependable self-service transaction processing and programmable call handling capabilities to carrier-sized operations. Compatible with most existing network architectures, the MPS 1000 offers a wide range of services for electronic commerce applications. A single MPS 1000 system starts at 4 digital spans and grows to 384 spans; 120 to 11 520 VoIP channels. MPS 1000 outperforms in hosted environments.

MPS 1000 supports VoiceXML, CCXML, and SSXML. This full-featured solution allows the creation of sophisticated self-service applications combining our proven award-winning speech portfolio with the virtually limitless data resources of the Web. These technologies allow customers to say what they want naturally and provide multiple pieces of information in a single phrase to simplify the navigation process. Call Protect along with the N+1 Application Processor keeps the customer connected even if a failure occurs in the network. Because MPS 1000 uses Windows Standard Server 2003, Windows XP, or Solaris 10, customers can choose the operating system that best suits their infrastructure. The open system architecture and design supports traditional TDM or IP environments, or both on the same system.

An integrated suite of GUI tools is used for application development and system operations, administration, and maintenance (OAM) across the entire suite of Nortel self-service offerings.

Ideal For

- medium to large enterprises with essential contact centers supporting a high volume of transactions
- large carrier and service providers

Business Challenges

- Do you want to control the operational costs of your contact center?
- Do you need a platform that acts as a media gateway?
- Do you need to reduce network costs?
- Does your contact center staff regularly handle repetitive, routine calls?
- Are you looking for a full-featured, carrier-class-integrated voice response (IVR) system that is suitable for diverse contact center environments?

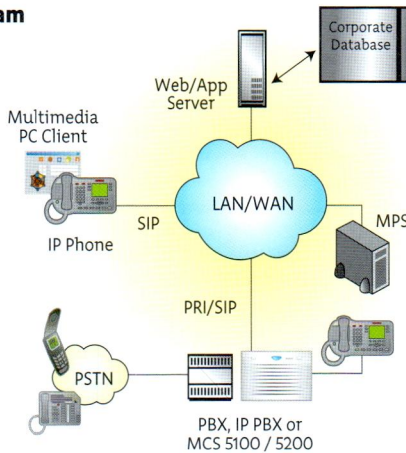
Typical Applications

- Contact centers that handle many routine calls.
- Businesses that need to provide customers with 24-hour-a-day, 7-day-a-week access to their

services.

- Customer-oriented organizations that want to eliminate aggravation, wasted time, and delays by providing information to callers without the need for them to wait in a queue to speak to an agent.
- Organizations that want to increase revenues and save costs by providing new services in response to the ever-changing needs of their customers.
- Contact centers that need to alleviate agents from repetitious tasks to deliver superior customer service to valuable clients and to handle complex calls.
- Applications, with CTI software, that need to display information that the customer enters on the agent's desktop, thus removing the need for the agent to ask the customer to repeat information.

Network Diagram



Key Points

- Delivers mission-critical reliability to protect against lost service revenue.
- Supports almost unlimited future growth by scaling from 96 to thousands of ports.
- Delivers robust multilingual advanced speech capabilities for friendly self-service and a personalized customer experience.
- Broadens service-creation capabilities by providing a dual application-development environment that supports the VoiceXML industry standard to hasten delivery of new applications and to provide a graceful migration path for the future.
- Supports a hybrid environment of traditional and VoIP telephony protocols that enables smooth

transition to VoIP without costly hardware upgrades.

- Hastens service deliveries by simplifying application development and streamlining network configuration and management.
- Improves customer service and reduce wait times through dynamic, nonblocking, resource sharing.
- Increases efficiency of existing network components, reducing costs for new hardware.
- Reduces floor space requirements to save space and reduce maintenance costs.
- Integrates easily into the existing infrastructure by supporting a wide variety of telephony and network protocols, hosts, and databases to essentially eliminate the need for costly network re-engineering.

Features and Benefits

- **Redundant, fault-tolerant solution** offers a redundant hardware architecture and distributed software. Enterprises can configure redundant hardware to provide the continuous operation of critical components such as application processors, ATM switches, network interface controllers (NIC), and system clocks. Enterprises can install or replace stand-by units such as ATM switches, hot-swappable NIC cards, and warm stand-by application processors without a system interruption or with a manageable system interruption.
- **Advanced speech recognition** supports speech-enabled self-service solutions that can promote the corporate brand and provide callers with the same friendly customer experience that they would expect when dealing with a human agent. Advanced speech recognition can reduce the number of calls your customer representatives handle, increase overall system operating efficiency and dramatically strengthen customer offerings by linking customers directly to a business. Communicating using speech rather than touchtone input creates a natural flow for users that can increase their levels of comfort when using the service. The easier and faster self-service is, the more people will

use it, reducing operating costs because each call requires less agent time and the average length for each call is shorter.

Speech recognition capabilities include:

- Large vocabulary recognition (LVR) accurately recognizes tens of thousands of words. LVR automates many different types of transactions to eliminate the need for complex and confusing navigation.
- Natural language understanding (NLU) allows customers to use their own phrasing to answer a menu prompt. With the conversational interaction that NLU provides, customers can say what they want, use alternative expressions for menu selections, and provide multiple pieces of information in a single phrase. Such phrases can automate certain revenue-generating calls that are too complex for touch-tone input.
- Speaker verification applies biometric technology to verify callers' identities based on the unique characteristics of their vocal patterns. Speaker verification quickly and accurately authenticates the caller, thereby complementing or replacing other authentication methods, such as touch-tone personal identification numbers (PIN) or passwords.
- Text-to-speech (TTS) conversion translates ordinary text into intelligible speech. This technology communicates information to customers when possible selections spoken to callers can include many items from databases or when a list of selections changes regularly.
- **System flexibility** supports a variety of interactive voice-processing applications and builds on multiple application environments typical of enterprise and service provider marketplaces. A wide selection of telephony and host computer connectivity interfaces simplifies the integration of automated functions into existing data-processing and communications environments.
- **Strong VoiceXML Application Development environment** Nortel implementation of VoiceXML complies with

version 2.0 of the VoiceXML specification. Nortel MPS 1000 incorporates a VoiceXML browser that executes voice dialogues that Web servers create. The Nortel MPS VoiceXML browser is a client-tier component that runs on the Nortel MPS 1000 platform. Nortel MPS Developer applications are constructed using visual icons that make it easy to understand how they work and easy to change them. Nortel MPS Developer can support capabilities that the VoiceXML specification currently does not address such as preanswer processing and SS7/C7 integration. Developers familiar with XML-based markup languages, especially if the data to support transactions comes from Web servers, learn MPS Developer quickly.

- Nortel continues to support applications developed with MPS Developer to provide a dual application development environment if required. This development environment offers options launching previous applications written using the intuitive, graphical development environment of Nortel MPS Developer (formerly known as PeriProducer) or the text-based markup language of VoiceXML. Either application format can be launched from the other make all existing applications current with the latest in design tools.
- **Increased resource use** allows dynamic allocation of system resources to help ensure maximum use while reducing the hardware needed and reducing system cost.
- **Integrated suite of graphical user interface (GUI) tools** focuses on ease of use and support. The MPS 1000 includes a graphical application development environment; a graphical speech digitizing and processing tool; a browser-based graphical toolset for system administration, operation, and control; and a statistics and reports management tool.
- **System interoperability** allows businesses that currently have either the Nortel VPS/is or the Nortel MPS 100 units installed on their networks to easily install the Nortel MPS 1000 to unite the existing units into a cohesive, enterprise-wide IVR solution. Applications that are in use on the Nortel VPS/is systems are compatible with Nortel MPS 1000, saving the time and expense of rewriting and recoding applications. Some applications can require slight modification. All three platforms use the Nortel Media Processing Server Manager (formerly known as PeriView) suite of GUI tools. This suite of tools provides a cost-effective solution by reducing training costs and eliminating multiple software packages.
- **Enhanced multimedia capabilities** provide standard digital T1/E1 interfaces that are configurable for ISDN and common channel signaling (CCS7). The system architecture supports voice transmission over IP networks. The Nortel MPS 1000 supports the H.323 standard so that users who run H.323-compliant software can place or receive calls. The system switching supports seamless H.323 and SIP VoIP client interfaces with both T1 and E1 standards.
- **Hybrid digital and VoIP architectures** support both digital and IP voice protocols. Organizations that need a hybrid digital or VoIP environment have a smooth migration path to protect existing hardware investment. VoIP TMS modules co-reside with T1 TMS modules and fully communicate with each other. Organizations can gradually replace expensive leased lines by shifting telephony traffic to the IP network. This design removes the need for forklift switch replacements as VoIP technology continues to mature and provides a future-proof IP-enabled IVR solution.
- **Remote management** allows comprehensive management services provided by the Nortel MPS Manager application, which combines local management with visibility into branch installations from the central site. The centralized, Web-based management approach increases the efficiency of management personnel. This approach reduces the need for management personnel to visit to branch office and lowers the cost of system maintenance.
- **Nortel Natural Speech Navigator powered by Nuance Open Call Steering** is new to our speech portfolio. Callers want an intuitive and simple experience when using self-service applications. They want to benefit from a single

prompt from which all destinations can be reached and eliminate the challenge presented by complex menu trees. Nortel Natural Speech Navigator allows callers to focus on speaking their requests instead of navigating menus, which is where many customer calls drop. Callers are promptly directed to the appropriate expert, regardless of whether this is another self-service application, a contact center agent or other knowledge worker. The result is a greatly enhanced caller experience.

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Nortel ranks number one in several IVR industry analyst reports. Unlike the new competitors in this market segment, Nortel has held a leadership position in the business for more than 30 years and understands contact centers and what it takes to deliver complex self-service applications. Nortel has a large research and development organization with dedicated

engineers. Many Nortel competitors offer only the IVR solution. Nortel provides the full portfolio, including Nortel Professional Services Organization (PSO). Nortel has a clear evolutionary path from the Nortel Voice Processing series (VPS) to the Nortel MPS; and within Nortel MPS, from traditional telephony to VoIP, from traditional application development to VoiceXML and CCXML, and from basic self-service to speech-enabled applications. The Nortel portfolio affords organizations a single point of contact for all their communications needs and few issues with integration.

Nortel offers the Media Processing Server 1000 on either a Solaris or Windows platform. The MPS 1000 fits into existing voice and data infrastructures with no need to re-engineer the network. MPS 1000 is deployed in carrier or hosted application environments.

Technical Specifications

Platform	Unix (Solaris 2.8)
Cabinet Capacity	1536 ports of T1, 1920 ports of E1, or 1920 ports of VoIP (H.323) up to 6 cabinets per system: 9216 T1 ports 11520 E1 ports 11520 VoIP channels per system or a combination of digital and VoIP
Telephony Protocols	T1 and E1 E1 DPNSS ISDN PRI interface Nortel ISDN (National ISDN-1 proprietary variant for DMS and Meridian switches) AT&T or Lucent ISDN (National ISDN-1 proprietary variant for ESS and Definity switches) National ISDN-2 Euro ISDN Line Side T1 and Line Side E1 compatibility for Nortel Meridian PBX and the Avaya G3. VoIP - H.323 and SIP SS7 Support - CCSS Version 6.1 / 6.2

Protocols Supported over Ethernet LANS	TCP/IP sockets TN3270 over Ethernet TNVT100 over Ethernet LU6.2 using Brixton server over Ethernet SNA3274 using Brixton server over Ethernet The MPS Application Processor can support an Ethernet TCP/IP interface operating at either 10 Mb/s or 100 Mb/s. The Ethernet LAN connection supports 10Base-T (twisted pair) or a 100Base-T connection as standard.
Supported Integration	Oracle Sybase Informix MS SQL (ODBC) DB2
MPS Host and WebServer access	TN3270 TNVT100 TCP/IP Sockets SNA3270 (Ethernet) LU6.2 (Ethernet) CORBA HTMLS SSL XML VoiceXML ISAM/HSAM JAVA Services Bridge
Speech Language Support	SpeechWorks OSR 1.1 Nuance 8 Fonix FFAST 5.2
CTI Interfaces	CISCO ICM (Geotel ICR) ICM/VRU version 2.6 Genesys T Server 6.5
Fax Capabilities	Send and receive FAX storage in MMF or Class F TIFF files Fax encoding using G3 CCITT Group 3 (1d) Fax format
Dimensions	Height: 229 cm (90 in.) Width: 60 cm (23.5 in.) Depth: 83 cm (32.5 in.) Weight: 363 kg (800 lb) typical, 409 kg (900 lb) maximum

Ordering Information

For further information, contact your local Nortel representative.

Nortel Speech Server



Overview

The Nortel Speech Server is a speech-processing platform that provides multifunctional capabilities in an open, scalable environment. The platform supports large-vocabulary speech recognition, natural-language understanding, text-to-speech conversion, and speaker verification. The client-server architecture supports dedicated speech servers. These servers help to ensure ideal, predictable system performance regardless of the speech-processing algorithm seller, complexity of the speech application, or associated grammars.

Ideal For

- Any business interested in enhancing customer access to automated services.
- Contact Center operations that want to support advanced speech-processing applications in an open and scalable environment.

Business Challenges

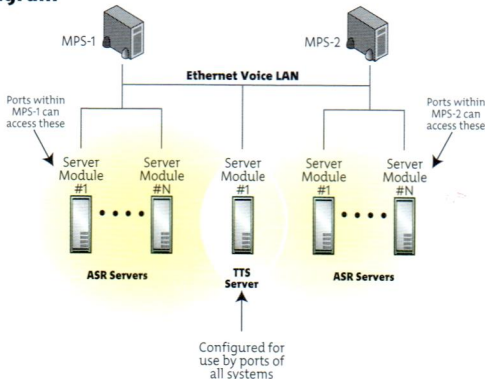
- Does your business need a cost-effective solution that provides scalable support for all sizes of applications?
- Does your business need a highly accurate application that includes multilingual support?
- Is your application critical to the success of your business?
- Are your agents spending too much time on simple, mundane, repetitive processes?
- Can your system automate your application without human intervention while retaining a high-level of customer satisfaction?

Typical Applications

Every market can deploy speech applications. Some of the typical areas where applications are successful, including some solutions, are as follows:

- Airlines: reservations, flight information, ticket status, pricing, and general information.
- Municipal governments: check deposit status, fax forms, and Frequently Asked Questions.
- Financial institutions: banking, mortgage, and telephone applications.
- Securities: trading.
- Prepaid services: calling cards.
- Catalog sales: order placement, status and delivery.
- Large educational institutions: registration and tuition payments
- Order processing systems: order placement.
- Transportation services: delivery status verification.

Network Diagram



Key Points

- Advanced speech-processing power using natural-language speech recognition, text-to-speech conversion, and speaker verification engines.
- Scalable architecture that grows as the customer's needs grow.
- Investment protection that provides the lowest possible life cycle costs.
- "Barge-in" feature provides added flexibility for callers using speech recognition to interrupt a system message or to prompt a short call-holding time.
- Choice of industry-standard processors and operating systems including SPARC/Solaris, UNIX, and Windows Pentium.
- Natural language interface provides external customers ease of system use and speed in processing functions.

Features and Benefits

- Businesses can take advantage of scalability to add speech servers to improve server performance. This scalable architecture makes it easy for businesses to add more speech processing capabilities as their businesses grow.

Ordering Information

For further information, contact your local Nortel representative.

- Dedicated, speech-processing resources do not affect on speech server resources.
- Cost-effective resource sharing supports shared architecture for the most efficient, reliable platform for modern speech technologies. Pools of MPS system ports can share pools of speech resources to support popular speech technologies.
- The Speech Pool Manager can use speech-processing reliability to detect automatically when a speech server module is out of service and to direct new speech requests to other available resources.
- Best-in-class speech algorithms support advanced speech-processing applications in a modular and scalable environment.

Technical Specifications

The Speech Server hardware modules are based on industry standard processors and operating systems. Current offering includes:

Windows 2003:

- Dual Pentium 3.6 GHz
- 1 GB RAM (optional expansion to 2 GB)

Nortel Web-Centric Self-Service

Overview

The Nortel Web-Centric Self-Service (WCSS) offers a range of self-service options for enterprises and hosted service providers to capitalize on existing Web infrastructures for new levels of customer engagement through automated, self-services applications. Nortel WCSS provides a standard to create multitier, Web-based voice-processing applications. Core application logic can reside separately from branding, service, and operational elements. Through WCSS, developers can quickly deliver consistent operational, reporting, and context services across disparate voice-processing applications.

Enterprises can now "engage" with customers by providing dynamic, adaptive, and personalized services that build on the richness of Web resources yet are accessed easily using natural speech and the telephone.

WCSS maintains continuity of brand identity across channels. Web pages accessed using HTML browsers are a powerful force for communicating corporate brand values. WCSS enables those same brand values to be delivered through voice-processing applications to both external customers and internal employees.

Ideal For

- Enterprises that want to deliver highly reliable voice applications to the Web-oriented world.
- Enterprises that need to integrate speech-enabled voice-processing applications into their Web infrastructures.

Business Challenges

- Does your business need flexibility for its self-service solutions?
- Does your business need to integrate its Web applications into a self-service environment?
- Does your business need to address diverse application development tools to satisfy customer needs?

Typical Applications

Information retrieval: WCSS is ideal for applications where input requires a few navigational commands and moderate data entry.

E-commerce: Web-Centric Self-Service is well suited for customer service applications such as ordering merchandise, tracking parcel shipments, checking account updates, and using call center services.

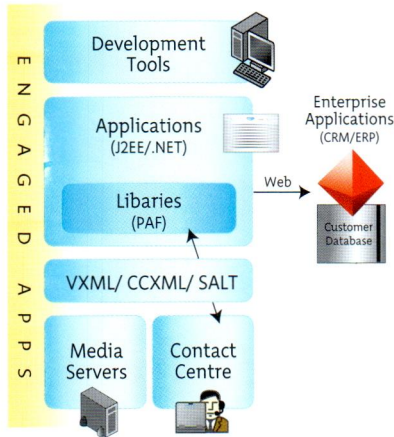
High-touch Telephony Services: Web-Centric Self Service extends the telephony services by offering services such as personal name dialing, notification services, one-number "follow me" services, teleconferencing, and other telephone services.

Directory Assistance: Corporate name dialing as a packaged application on a secure Web site makes it easy to reach a colleague whose number is not known by speaking the colleague's name or department.

Internal Processes: Because security features that apply to the Web, such as firewalls and encryption, can apply to voice applications as well, WCSS supports secure intranet applications that voice-enable internal processes, such as supply ordering, human resources self-service, and corporate news.

Unified Messaging: For today's high volume of mobile employees and people with multiple contact channels, WCSS can unify voice and electronic channels, for example, by reading and recording email over the telephone, and originating and terminating pager messages on the telephone.

Network Diagram



Key Points

- Advanced speech-processing abilities using natural language speech recognition, text-to-speech conversion, and speaker verification engines.
- A scalable architecture that grows with the customer's needs.
- Investment protection that provides the lowest possible life cycle costs.
- "Barge-in" feature provides added flexibility for callers using speech-recognition to interrupt a system message or to prompt for a short call-holding time.
- Choice of industry-standard processors and operating systems including SPARC/Solaris, UNIX, and Windows Pentium.
- Natural language interface provides external customers ease system use and speed in processing of functions.

Features and Benefits

Businesses can take advantage of scalability to add speech servers to improve server performance. This scalable architecture makes it easy for businesses to add more speech processing capabilities as their businesses grow.

- Dedicated, speech-processing resources do not affect on speech server resources.
- Cost-effective resource sharing supports shared

architecture for the most efficient, reliable platform for modern speech technologies. Pools of MPS system ports can share pools of speech resources to support popular speech technologies.

- The Speech Pool Manager can use speech-processing reliability to detect automatically when a speech server module is out of service and directs new speech requests to other available resources.
- Best-in-class speech algorithms support advanced speech-processing applications in a modular and scalable environment.
- VoiceXML 2.0-compliant interpreter on the MPS platform interprets VoiceXML applications and controls speech and telephony resources such as automated speech recognition and speech synthesis systems, and audio play-and-record functions.
- Portable Application Framework (PAF) component offers applications a set of common services that reduce application development time and provide common features such as statistics, alarms, and tracing across applications in the form of building blocks that are reusable between applications.

Market Information

With the introduction of its WCSS portfolio, Nortel moved from being the leader in both touchtone

and speech-enabled self-service to the new voice-enabled Web applications through self-service solutions. Only a few organizations in the market currently address this philosophy of integrating self-service solutions into customers' existing Web services environment.

Technical Specifications

Choice of industry-standard processors and operating systems including SPARC/Solaris TM, UNIX, Pentium and Windows.

Hardware (minimum requirements):

- Processor: Pentium III with 1.2 GHz or higher
- Memory: 1 GB available
- Disk Size: At minimal 1 GB available
- Head Set with speaker and microphone (equipped with a mute button)
- Audio Cards

Operating System:

- Microsoft Windows

Ordering Information

For further information, contact your local Nortel representative.

Nortel Corporate Directory Dialer

Overview

The Nortel Corporate Directory Dialer is an off-the-shelf software application that enterprises of all sizes can use to connect calls in response to callers' spoken requests. The Corporate Directory Dialer delivers superior service by accurately recognizing up to 50 000 names of individuals and locations, including multiple nicknames, pronunciations, or sites, and reliably connects the call even when users do not know the official name or extension they need to reach. Previous-generation call dialers failed if they could not readily determine call routing. In contrast, a correctly configured Corporate Directory Dialer combines business logic with successive prompting and advanced speech processing to transfer more than 90 percent of calls without operator assistance.

Ideal For

Providing directory assistance over a phone, PDA, or PC to internally connect to personnel in large enterprises. The Corporate Directory Dialer application includes:

- transferring or conferencing calls
- running a browser-based engine to fine tune recognition and pronunciation
- using nicknames
- supporting 50 000 subscribers as a bundle
- enabling speech recognition and text-to-speech conversion from Scansoft or Nuance

Business Challenges

- Are overhead costs too high to have multiple

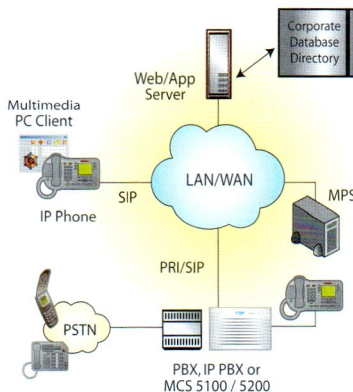
receptionists, telephone operators, or directory attendants?

- Is it difficult and expensive to maintain large multiple telephone directories corporate wide?
- Do callers complain that it is difficult to reach the correct person or department and they always need assistance to transfer a call?

Typical Applications

Large enterprise customers can have a speech-activated directory dialer that looks up a person's telephone number or SIP ID. The dialer automatically directs the caller to the called party. The directory dialer enables fast development, accuracy, and multiple name identification.

Network Diagram



Key Points

- Nortel Corporate Directory Dialer, based on VoiceXML 2.0, runs on an industry-standard Web application server.
- Nortel Corporate Directory Dialer works with existing LDAP databases of employees and departments.
- Businesses manage the Corporate Directory Dialer from a Web interface from any location.
- Grammars are easy to set up and maintain using a Grammar Maintenance Tool that scans the corporate directory database and creates a set of names that the application uses.
- Corporate Directory Dialer supports custom entry and exit prompts, call process prompts, location names, routing and recovery rules, and integration with other databases.
- Simplified administration is possible due to graphical Web-based tools that administer all aspects of configuration and operations.
- Accommodate multiple listings, homonyms, nicknames, and unusual pronunciations.
- Support custom-recorded greetings and prompts; fine tune application settings and grammars for optimum performance.
- Create an intuitive and natural customer experience through robust, advanced speech recognition.
- Improve inbound call efficiency by automating routine requests and freeing attendants for complex inquiries.
- Apply consistent call treatment and audio branding already used in radio, television, or Web environments.
- Generate automatically speech-recognition grammars from entries in the corporate directory.
- Support traditional and IP telephony environments.
- Integrate easily into your existing corporate directories and Nortel interactive voice response (IVR) infrastructure.
- Simplify service creation through packaged prompts, automatic grammar creation, and intuitive configuration menus.

Features and Benefits

- Improve customer satisfaction by connecting calls to individuals or departments quickly and accurately.
- Reduce caller wait time, abandoned calls, and network cost per call.

Technical Specifications

System Requirements	
Web application server	Processor: Pentium III, 1 GHz or higher Memory: (For Corporate Directory Dialer application): 512 MB + (number of MB x number of ports) Disk Size: (For local database): 5 GB + number of MB x number of subscribers Software: Microsoft Windows 2000 Server or Professional at SP2 or higher, J2EE Application Server Software (IBM WebSphere v4.0.3 or v5.0 or JBOSS Jetty Release 3.2.1 with SUN JDK 1.3)
Database	LDAP database (global directory of corporate personnel and departments)
Voice browser	VoiceXML 2.0-compliant running on MPS 500 or MPS 1000 Release 3.0 or higher Speech Recognition: Nuance 8.0 or later or SpeechWorks 2.0 Text-to-speech (TTS) speech synthesis: Speechworks Speechify
Database Fields	
Corporate Directory Dialer local database	Required fields: Employee ID, last name, first name, city, state, country, contact number (any one phone number from the optional fields such as nickname, internal phone number, external phone number, e-mail address, pager number, cell phone number, voice mail number)
System Statistics	
Application flow: How much interaction is required from the caller for a transfer	Number of calls transferred on name alone, requiring name and location, requiring the caller to spell out the request Transferred to operator (total), transferred to operator due to name not found, transferred to operator due to multiple names found, transferred to operator due to caller request for operator help Calls aborted by caller, unsuccessful, and total
Speech recognition	Average confidence level in recognizing names, location, or department
Database: Query performance	Number of database requests that returned employee information, no data, a single record, multiple records, or homonym conflicts. Average query time for LDAP queries and local database queries

Nortel Communications Control Toolkit

The Nortel Communications Control Toolkit 6.0 (CCT 6.0) is the new, cost-effective, simple-to-use, next-generation unified integration middleware platform for the Nortel Communication Server 1000 switch range, the Nortel Media Processing Server (MPS) 500, and the Nortel MPS 1000 Self-Service platforms. For more details on the product, see Nortel Computer Telephony Integration Portfolio in this Guide.

Ordering Information

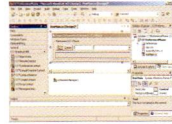
For further information, contact your local Nortel representative.

Nortel Computer Telephony Integration Portfolio

The Nortel Computer Telephony Integration (CTI) portfolio is the cost-effective, simple-to-use, next-generation unified integration middleware platform for the Communication Server 1000 switch range, the Nortel Media Processing Server 500, and the Nortel Media Processing Server 1000 Self-Service platforms. The Nortel Communications Control Toolkit enables integration of these telephony systems with business applications to unify business, enhance customer interactions, and drive improved efficiency and cost savings. The Communications Control Toolkit extends telephony to additional media types including e-mail, instant messaging, and video.

The product supports integrations for Microsoft Windows and highly secure solution deployments. The product is suitable for server and client integrations and application development.

Nortel Communications Control Toolkit



Overview

The Nortel Communications Control Toolkit 6.0 (CCT 6.0) is the new, cost-effective, simple-to-use, next-generation unified integration middleware platform for the Communication Server 1000 switch range and Media Processing Server (MPS) 500 and MPS 1000 Self-Service platforms. The product provides a CTI middleware compatible to the Nortel platforms based upon the Microsoft.Net framework. It supports integrations for Microsoft Windows and highly secure solution deployments. A Development Environment and API set based on the Microsoft.Net framework is available from the Nortel Developer Program (formerly known as PeriProducer).

Ideal For

Nortel designed the Communications Control Toolkit for deployment in contact center, knowledge worker, and self-service environments. The product is suitable for server and client integrations and application development.

Business Challenges

- Does your business need to reduce wait time for its callers?
- Is network reliability critical to your company?
- Do your contact center agents ask your customers repeatedly for the same information during a call?
- Do your contact center agents spend valuable time identifying your callers after they reach the contact center agents?
- Does your business want to provide preferential treatment to its valued customers?

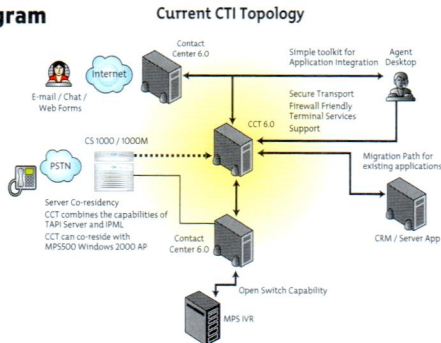
Typical Applications

- Contact center environment that requires skill-based routing ability of a Nortel Contact Center Server by allowing for the creation of agent applications such as software phones, agent telephony toolbars screen pops, and intelligent call management applications. In this environment, the Service Provider uses Meridian Link Services to communicate with the Contact Center Server. Through the Contact Center Server, the Communications Control Toolkit communicates with the switch. Optionally, the IPML Service Provider connects to an IVR server.
- **Knowledge worker environment** that does not require skills-based routing. The switch directs incoming calls to agents and Communications

Control Toolkit delivers caller information, such as ANI/DNIS, or caller ID (CLID). In this environment, the Communications Control Toolkit connects directly to the switch over the emulated LAN (ELAN). It connects to client PCs and application servers over the CLAN.

- **Self-service environment** that uses an IVR system for callers such as the MPS 500 or MPS 1000, to answer queries or request services. For example, bank customers might use IVR to confirm their account balances or to transfer funds. Agents do not handle calls. In this environment, Communications Control Toolkit and the IVR server connect to the switch through Contact Center Call Server. Communications Control Toolkit connects to the IVR system over the CLAN.

Network Diagram



Key Points

- Communications Control Toolkit 6.0 supports existing contact centre environments, TAPI SP 3.0, or IVR CTI 2.1-compliant integrations, to permit customers to schedule their solution and application migrations to CCT release 6.0. This permits existing applications written to these service providers to be used directly with CCT 6.0 replacing those service providers on a nodal or network-wide basis.
- Applications and integrations must be rewritten using the new CCT and API to avail the new CCT 6.0 features and capabilities.
- Nortel designed the Communications Control Toolkit as a full multi-media, multichannel middleware and toolkit product to provide full telephony support with release 6.0.
- The CCT provides multiple levels of abstraction (full, simplified, and graphical) and allows for varying Developer (formerly known as PeriProducer) skill levels.
- The CCT enables advanced contact center functionality, increases agent productivity, enhances customer service, and reduces operational costs.
- The CCT facilitates the development of desktop and server applications, screen pops, IVR integration and customer relationship management (CRM) connectors.

Features and Benefits

The Communications Control Toolkit Release 6.0 is the evolution of Nortel Computer Telephony Integration (CTI) products including TAPI SP 3.0 and IVR CTI 2.1. The Communications Control Toolkit incorporates the

features of these products with a number of powerful new features:

- A new easy-to-use graphical toolkit based on Windows Form Controls.
- A reference implementation that can be used in testing and can be easily modified to create a customized client application.
- Support for Windows Server 2003 Standard Edition and Enterprise Edition.
- An enhanced security layer based on TCP sockets for authentication and security for the toolkit.
- Firewall friendliness.

Market Information

- number 1 share IVR self-service—North America, EMEA, worldwide
- 2003 total ports shipped and revenue (Gartner, Frost & Sullivan)
- more than 8000 self-service IVR systems with more than 700 000 ports deployed worldwide
- more than 200 self-service advanced speech applications in use globally

Technical Specifications

The CCT is platform-vendor independent. Nortel recommends the following for new installations:

- 2.8 GHz Intel-based CPU, Pentium 4, Xeon, Xeon dp
- 1 GB RAM
- 1 NIC for Contact Centre or 2 NIC for Direct Connect (KW)
- 40 GB hard disk space

Ordering Information

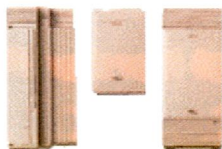
For further information, contact your local Nortel representative.

Nortel Norstar Portfolio

The Nortel Norstar portfolio is perfect as a voice communications platform for small and medium businesses that want many features and applications without complex instructions or training. A business with remote branches benefits from a platform that can accommodate from 2 to 224 users. With its reliability, durability, and merging of voice mail, e-mail, computer, and telephone Norstar is a cost-effective solution that can grow with the business.

- Nortel Norstar Integrated Communication System
 - Nortel: Systems – Compact 3X8
 - Norstar: Systems – Compact ICS
 - Norstar: Systems – Modular ICS
 - Nortel Norstar 7.0 Software and Digital Mobility
 - Nortel Messaging 100
 - Nortel Messaging 150
 - Nortel Norstar Call Center
 - Nortel Norstar VoIP Gateway
 - Nortel Norstar CTI - Personal Productivity Suite
 - Nortel Norstar TAPI Manager
 - Nortel Norstar Personal Call Manager
 - Nortel Norstar CTI Adapter

Nortel Norstar Integrated Communication System



Overview

The Nortel Norstar Integrated Communication System (ICS) is a full-featured, application-rich, voice communications platform for small and medium businesses and enterprise branch offices. Nortel Norstar solutions are ideal for any business with 2 to 224 employees. The solution provides a choice of applications, including voice mail and desktop messaging, call center, mobility, and computer telephony integration (CTI).

Whether a stand-alone business office, a multisite business, a franchise, a branch office, or a department within a large organization, businesses rely on their phone systems to perform every time someone picks up the receiver or presses a button. A business needs a simple-to-use telephone system with practical, scalable features and applications to secure a competitive edge in the market as the business grows. A business needs a cost-effective telephone system that does not entail costly end-user training. Nortel Norstar Integrated Communication Systems offer small and medium businesses and branch offices end-to-end solutions that enable businesses to focus on business.

Ideal For

- Ideally positioned for small to medium offices, but scalable for multisite businesses with basic site-to-site networking requirements.
- Enterprise branch offices with basic site-to-site networking requirements.
- Businesses that need a basic affordable telephony solution.
- Businesses that need a cost-effective, reliable, and easy-to-use solution for facilities with fewer than 224 employees.
- Businesses that demand an integrated communications platform that supports unified messaging, call center, and CTI applications.

Business Challenges

- Do you want a communications solution to improve your business image, customer service levels, and employee efficiency?
- Do you have employees who perform repetitive tasks such as directing calls, explaining the business location, or stating business hours?
- Do your employees want a single application that they can use to deal with voice mail and e-mail through one interface?
- Is your current phone system difficult to use?
- Do you spend too much time training new

employees to use your phones?

- Is your phone system unreliable or does it provide poor voice quality?
- Do you have employees who need to roam about the business and still be available to take or make telephone calls?
- Do you need a phone system for which you can control and monitor long-distance charges or day-to-day use?
- Do you want to identify a caller before you answer the phone?

Typical Applications

Nortel Norstar can accommodate home offices, small and medium businesses, and enterprise branch offices with as many as 224 users.

Key Points

- Versatility: Nortel Norstar supports a complete set of voice features and applications, mobility with roaming and hand-off capabilities, and sophisticated site-to-site networking applications.
- Simplicity: Nortel Norstar is easy to learn and use; it requires no special training because the liquid crystal display (LCD) on every telephone displays the steps that guide the user through features and applications.
- Reliability: With more than 14 million users, Nortel Norstar is the number one small

business telephony solution, with one of the lowest failure rates in the industry.

- **Flexibility:** With the Nortel Norstar modular architecture, businesses can add capacity and applications as required. Starting at 2 users, Nortel Norstar can grow to 224 users with multiple applications, while offering an unprecedented level of investment protection along the way.
- **In office mobility:** With the Digital Mobility portfolio, Nortel Norstar offers mobility to up to 64 employees within the office.

Features and Benefits

Every Nortel Norstar solution begins with an Integrated Communications System (ICS). This fully digital platform combines communications at the desktop. This combination includes voice mail, e-mail, computer, and telephone. The communication needs and size of a business help determine the best system for the company. Whatever system a business chooses, every Nortel Norstar CS offers the following advantages:

- High bandwidth to the desktop means the business can use applications like Integrated Signaling Digital Network (ISDN) and Computer Telephony Integration (CTI) without changing existing wiring.
- The modular, scalable design means a business can choose the system that fits its immediate and future needs.
- Digital technology creates a platform for current and future PC-based applications.
- Outstanding quality makes Nortel Norstar one of the most durable and reliable voice solutions available. The Nortel Norstar delivers one of the lowest failure rates in the industry with a tested mean time between failure (MTBF) rate of 100 years for the Compact ICS.
- A complete applications suite:
 - call centers that provide superior customer service through in-bound call capture, load balancing, and intelligent routing
 - CTI that improves employee productivity and provides management of calls from a PC screen
 - desktop messaging that solves information overload issues by having users retrieve all in-bound communications, whether voice mail or

e-mail, from one unified mailbox

- digital networking that reduces long-distance charges by letting businesses send voice mail messages to other locations over the data network rather than the voice network
- digital mobility that completely interoperates with most key features to increase the accessibility of employees
- private networking that gives employees seamless remote office connectivity
- Extensive connectivity options:
 - trunking configuration can include analog loop start, analog calling line identification (CLID), analog Direct Inward Dial (DID), Ear and Mouth (E&M) Tie, T1, ISDN BRI and PRI, basic IP trunks
 - station options are Business Series Terminals, Doorphones, T7406 Cordless Telephone, Digital Mobility handsets, and analog
- Nortel Norstar Remote Utilities enables administrators to program and maintain the Nortel Norstar system from a remote location. This saves enterprises and service providers time and money.
- private networking supports Norstar-to-Norstar networking and networking to a Meridian 1, along with the following capabilities:
 - centralized voice mail
 - centralized attendant
 - private numbering plan
 - network call redirection
 - trunk route optimization
 - network tandem calling
 - private numbering plan
 - system calling line ID
- With Norstar-to-Norstar Investment protection, businesses can reuse trunk cards, telephones, and applications as they move from the Compact ICS to the Modular ICS platforms. With Norstar-to-BCM Investment protection, businesses can upgrade to the Business Communications Manager (BCM) platform and reuse their telephones.

Nortel Norstar: Systems – Compact 3x8

Simple, yet sophisticated, designed for small businesses and supports:

- up to three Central Office (CO) lines and eight

- telephone extensions
- voice mail, automated attendant, and telephone support
- all Business Series Terminals, including full-featured digital functions with LCD screen and soft keys

Nortel Norstar: Systems - Compact ICS

A flexible building-block design expands with a business easily and cost-effectively:

- grows from a 4x8 to an 8x24 capacity
- supports voice mail, automated attendant, telephones, basic call center, and CTI
- businesses can add enhancements as business needs change
- supports all Business Series Terminals

Nortel Norstar: Systems - Modular ICS

Designed to be flexible and scalable, the Modular ICS has ample room to expand the software and hardware capacity, and it supports:

- 248 ports in various configurations
- advanced integrated applications that include voice messaging, unified messaging, digital networking, and enhanced call centers
- software and system expansion modules that allow growth as business requirements change
- all Business Series Terminals

Nortel Norstar 7.0 Software and Digital Mobility

Nortel Norstar 7.0 software introduces new features and capabilities for small and medium businesses including:

- capacity increase providing access to Module 13 and 14 for 1 to 32 additional stations
- Digital Mobility Solution:
 - scalable from 1 to 64 users with coverage exceeding 15 Million square feet
 - Digital Mobility Controller 080 (DMC 080) supports 1 to 8 handsets and 2 base stations (link 2 for 16 handsets and 4 base stations)
 - Digital Mobility Controller 320 (DMC 320) supports 1 to 32 handsets and 2 base stations (link 2 for 64 handsets and 8 base stations)

- integrated access to features and voice mail
- no "dead zones" and no airtime charges
- long battery life for portable phones (speech and standby time is 10 and 90 hours, respectively)
- secure and confidential conversations

Nortel Messaging 100

A sophisticated messaging system for small businesses that accommodates changes as the business grows. The system is simple to manage and maintain and is scalable with many features that allow businesses to simply and incrementally add and pay for mailboxes:

- equipped with 10 mailboxes
- grows to 40 mailboxes
- 4 ports with nine hours of message storage
- many features give the small business big business capabilities, including single-digit dialing, external transfer, CLID integration, off-premise message notification, Web-based administration, downloadable greetings, silent monitor capabilities, and park and page from mailbox
- Optional Desktop Messaging, VPIM/AMIS Networking and Basic Call Center, and Call Center Reporting

Nortel Messaging 150

An advanced messaging and applications system for small and medium businesses that grows with the business as requirements change. The system is simple to manage and maintain and is scalable with many features that allow businesses to simply and incrementally add and pay for features, mailboxes, and applications:

- equipped with 32 mailboxes
- grows to 300 mailboxes
- 8 ports with 82 hours of message storage
- 2 seats of unified messaging
- Basic Call Center
- many features give big business capabilities, including single-digit dialing, external transfer, CLID integration, off-premise message notification, Web-based administration,

downloadable greetings, silent monitor capabilities, and park and page from mailbox

- centralized voice mail capabilities
- Optional Enhanced Call Center
- Optional VPIM/AMIS networking

Nortel Norstar Call Center

Norstar Call Center applications make it easy to create a formal or informal call center. Experiences with varying-sized businesses indicate that quality call center services can realize a 10-percent reduction in toll charges (800 prefixes), a 15-percent reduction in abandoned calls, and a 20- to 40-percent increase in agent productivity. Norstar supports two call center applications depending on customer needs.

•Basic Call Center

- 15 lines
- 10 active agents
- 2 queues
- 30 recorded announcements

•Enhanced Call Center

- 30 lines
- 50 active agents
- 30 queues
- 50 recorded announcements

Nortel Norstar VoIP Gateway

The Norstar IP Gateway is an analog VoIP solution for the Compact ICS and the Modular ICS. The Norstar VoIP Gateway provides a cost-effective networking solution for existing Nortel Norstar users. The Norstar IP Gateway offers new users entry into VoIP with minimal investment and enhances the migration path to a complete converged solution. A built-in browser-based OAM makes the installation easy and allows access to any site on the network:

- each gateway supports four VoIP trunks
- caller ID support
- private network dialing
- interoperability with Business Communications Manager, Meridian 1 ITG, and Communication Server 1000
- Nortel distributed and supported

Nortel Norstar: CTI - Personal Productivity Suite

This powerful suite of applications includes: Personal Call Manager, Norstar TAPI Manager, installation software for all CTA devices, demos and information on Computer Telephony Integration (CTI) applications, an external connectivity device (CTA100) for users, and an internal CTA device (CTA160i) for easy installation.

Key Features:

- Full 32-bit implementation supports a broad range of applications.
- Direct-connect CTI provides a direct connection to a desktop PC and Norstar set to save wiring costs.
- With server-connect CTI, a single CTA device can connect to the Norstar, and any PC on the LAN can realize the benefits of CTI and Telephony Application Programming Interface (TAPI).

Nortel Norstar TAPI Manager

- Provides a simple and flexible tool for implementing CTI through a direct-connect or client/server configuration
- Includes drivers for all Norstar Computer Telephony Adapters
- Supports broad range of applications running on Windows 95, Windows 98, Windows 2000, Windows NT, and Windows XP operating systems

Nortel Norstar Personal Call Manager

- Screen displays of incoming and waiting call information.
- Point-and-click dialing.
- Drag-and-drop conferencing and call transfer.
- On-screen display of call status.
- Voice announcement of incoming callers using recorded files.
- Call logs (incoming and outgoing) with sort and print capabilities.

Nortel Norstar: CTI Adapter

Norstar Computer Telephony Adapter (CTA) devices bridge the gap between telephone systems and computers. Microsoft developed the TAPI standard used within CTA devices to work with a variety of CTI applications. Two CTA devices are available: CTA100 is a desktop device, and the CTA160i fits into a desktop PC expansion

slot. Both devices offer the same level of CTI integration for Norstar.

Key Features:

- Direct-connect CTI: Used when the CTA device is directly connected to a desktop PC and Norstar.
- Server-connect CTI: Enables CTI and TAPI applications on any PC on the LAN with a single CTA device connection with the Norstar.

- Autodetect CTA device: Automatically detects the CTA device connection to a COM port to eliminate the need to set the correct COM port during installation.

Market Information

Every Norstar telephone set, including courtesy or executive telephones, is equipped with a built-in display. The display ensures simplicity and reduces the training expenses that a business can incur for employees to become familiar with the telephone system. In addition, the telephones are equipped with a speakerphone, headset, and wall-mount capabilities to eliminate costs for additional supporting hardware.

Technical Specifications

	Norstar: Systems - Compact 3 x 8	Norstar: Systems - Compact ICS	Norstar: Systems - Modular ICS
Service Tone Cadences	Busy 0.5 on and off Ring back 2.0 on and 4.0 off	Busy 0.5 on and off Ring back 2.0 on and 4.0 off	Busy 0.5 on and off Ring back 2.0 on and 4.0 off
Power	Voltage V ac 110–120 Current A rms (max) 300 Frequency Hz: 45 – 70 Crest Factor 4.0	Voltage V ac 110–120 Current A rms (max) 1.9 Frequency Hz: 45 – 70 Crest Factor 4.0	Voltage V ac 110–120 Current A rms (max) 2.6 Frequency Hz: 47 – 63 Crest Factor 4.0
Dimensions	Height: 33 cm (13 in.) Width: 24 cm (9.4 in.) Depth: 7.5 cm (3 in.) Weight: 2 kg (4.4 lb)	Length: 43.5 cm (17.1 in.) Width: 23.8 cm (9.4 in.) Depth: 16.8 cm (6.6 in.) Weight: 3 kg (6.7 lb)	Height: 63 cm (24.8 in.) Width: 30 cm (11.8 in.) Depth: 17 cm (6.7 in.) Weight: 14 kg (30.8 lb)

Ordering Information

For further information, contact your local Nortel representative.

Nortel Meridian 1 PBX Portfolio

The Nortel PBX solutions address the total communication needs of a business, especially one with different needs for different users. The systems are built on the most current digital switching equipment and software program control. Each product offers cost-effective, high-quality, versatile features for small, medium, and large businesses or networked branch offices. In addition, the IP Trunk and Line card software provides organizations of varying sizes with solutions for increased cost savings and flexibility while maintaining simplified operations and administration.

- Nortel Meridian 1 PBX portfolio
 - Nortel Meridian 1 PBX 11C-Cabinet (wall-mounted cabinet)
 - Nortel Meridian 1 PBX 11C-Chassis (rack-mounted chassis)
 - Nortel Meridian 1 PBX 61C
 - Nortel Meridian 1 PBX 81C
- IP Line Card
- IP Trunk Card

Nortel Meridian 1 PBX Portfolio



Nortel Meridian 1
PBX 11C - Chassis



Nortel Meridian 1
PBX 11C - Cabinet



Nortel Meridian 1
PBX 61C - 81C

Overview

As a platform for integrated voice and data, each Nortel Meridian 1 PBX delivers sophisticated messaging, contact center and computer telephony integration (CTI) applications for improved customer service, and mobility and wireless technologies for "anywhere, anytime" information access. With Meridian 1, small call centers have the same flexibility and reliability as a large organization with mobile employees who need "virtual office" features. Each system is scalable for seamless growth, is easy to use and manage, and offers numerous features and services built around the most current technology.

Ideal For

- The Meridian Option 11 Chassis is ideally suited for small and growing businesses and enterprise branch offices that require from 60 to 128 lines
- The Meridian Option 11 Cabinet is suited to single and multi-site businesses with 30 to 800 lines.
- The Meridian Option 61C and 81C systems address the needs of medium to large businesses by offering port scalability and processor redundancy for enhanced reliability. The 61C supports up to 2000 lines while the 81C supports up to 16 000 lines. These systems are ideal for businesses where resilience is a major consideration such as in a contact center.
- The Meridian PBX portfolio has a solution for any size enterprise that needs reliable, powerful and flexible performance from its voice communications system.

Business Challenges

- Are you considering VoIP, but are not quite ready for a full-scale IP deployment?
- Is the ability to migrate to IP in the future important?
- Do you want to deploy a cost-effective, highly flexible, extremely functional, robust telephony solution with the ability to expand on an as-needed basis?
- Does your organization need the ability to expand to up to 16 000 stations?
- Is dual processor reliability a consideration?
- Will your site host remote locations?

Typical Applications

- The flexible, feature-rich design of the Nortel Meridian 1 PBX supports easy configuration for contact centers, hospitality services, banking and finance operations, as well as for general business needs.
- Advanced voice features, data connections, LAN communications, CTI, and sophisticated information services supports up to 16 000 ports; LAN and WAN IP telephony.
- Efficient distribution of incoming calls through Nortel Meridian Automatic Call Distribution (ACD) and/or Nortel Contact Center and self-help interactive voice response (IVR)
- Network telephony services for global PSTN interface. Analog, ISDN and IP networks are seamlessly extended for central or distributed applications, either nationally or internationally.
- Integrated branch offices, remote workers and teleworkers extended using TDM or IP

Key Points

- the number one business communication system worldwide
- scalable, distributed platform for "seamless" growth up to 16 000 ports
- modular architecture for inherent flexibility and cost savings
- commercial processors for scalable real-time processing capacity
- real-time, industry-based, multitasking commercial software operating system
- comprehensive feature offerings across the entire system portfolio

- sophisticated PC-based Nortel CS1000 Telephony Manager 3.0 for easy-to-use system administration
- the most effective integrated applications (Integrated Conference Bridge, Integrated Call Director, Integrated Recorded Announcer, Integrated Call Assist, Digital Enhanced Cordless Telecommunications, and CallPilot Unified Messaging)
- powerful networking features for the public switched telephony network, private and virtual private network access
- supports Voice over IP with IP gateways and telephones
- a range of telephone sets to serve the different needs of different users in an organization
- a hybrid solution with an IP telephony signaling server with many IP benefits for Nortel Meridian users
- an evergreen design to facilitate future technology and feature enhancements

Nortel Communication Server 1000 software

All Nortel Meridian PBX models operate on Communication Server 1000 software which is currently at Release 4.5. The latest features are described below:

Features and Benefits

Feature	Benefit
New Platform	Option 11 as a Branch Office: convert a single Cabinet or Chassis system into a Media Gateway 1000B hosted by a CS1000.
Scalability	ESN Location Expansion: increase the number of location codes that can be configured from 1 000 to 16 000.
Enhancements	IP Peer Capacity Enhancement: increase H.323 virtual trunks from 382 to 1 200 and supports up to 1 800 SIP virtual trunks per signaling server.
Clients	IP Client Portfolio Expansion: include support for Phase II of the IP Phone 2002 and 2004 with integrated switch, the IP Phone 2001 single line set, the IP 2006 graphical display phone, the IP Phone 2007 with touch-screen display, the IP Phone 2033 conference room phone, the Mobile Voice Client 2050 PDA application and the IP Key Expansion Module (KEM), the IP Phone 2007 Touch-screen, and the IP Phone 2033 Conference Phone.
Productivity	Personal Directory, Redial List, Callers List: provide advanced directory and call tracking capabilities for the Nortel Digital Phones and the Nortel IP Phones Microsoft Outlook Integration with Integrated Conference Bridge Release 4 – schedule a bridge session directly from Outlook. Emergency Services Access introduced in Europe, Middle East and Africa (EMEA) Market. Enhanced 911 Client Mobility AUDIT: provide an easy method for ensuring accurate 911-call routing. IP Call Recording: provide advanced call detail recording for IP calls.
Networking	Network Address Translation (NAT) Traversal Enhancements: easily and securely deploy IP Phones. Trunk optimization Enhancement: extend optimization to calls modified by call transfer or conference.
New Survivable Remote Gateways	Nortel Survivable Remote Gateway 50: provide a cost-optimized solution for the less-than-32 user branch office
System Management	CS1000 Telephony Manager 3.0 Management of Survivable Remote Gateway Corporate Directory enhancements Serviceability enhancements such as SNMP alarm browser Support for Microsoft 2003 Server Configuration and maintenance of traditional routes and trunks

Nortel Meridian 1 PBX 11C Cabinet (wall-mounted cabinet)

Meridian 1 Option 11C Cabinet delivers advanced applications and carrier-grade, 99.999 percent reliability for traditional voice and Voice over IP communications. Expandable to 800 lines, the 11C supports desktop and system features of large Meridian 1 systems, including digital and IP telephones, IP Gateways, mobility (802.11) communications, voice messaging, contact center, PC-based system management, and multimedia applications.

- delivers maximum investment protection by providing a smooth transformation into a Nortel CS 1000 or Media Gateway 1000B for extending branch offices over an IP network
- best-in-class price performance; the 11C Cabinet boasts a mean time between failure rate measured in decades.
- reliability with self diagnostics and backup monitoring
- IP Expansion option supports distribution over IP
- easy to use, manage, and integrate into an existing network environment

Nortel Meridian 1 PBX 11C Chassis (rack-mounted chassis)

Meridian 1 Option 11C Chassis has all the attributes of the 11C Cabinet, but in a smaller chassis package. It is cost optimized for small (60 to 128 line) branch offices.

- easily expanded using multiple chassis for up to 800 ports
- supports all Meridian 1 networking protocols and applications
- wall-, table- or 48.25 cm (19-in.) rack-mountable for maximum flexibility

Nortel Meridian 1 PBX 61C

Meridian 1 Option 61C is a carrier-grade platform supporting both traditional voice and Voice over IP communications for enterprises requiring from 200 to 2 000 lines.

- modular client/server architecture for flexibility, scalability, and cost savings
- redundant call processing core for extra reliability in mission-critical enterprises

Nortel Meridian 1 PBX 81C

Meridian 1 Option 81C, with five-nines reliability, delivers traditional voice and Voice over IP communications for large enterprises requiring from 200 to 16 000 lines.

- internal 622Mb/s OC-12 switching fabric supports scalable growth up to 16 000 lines
- modular client/server architecture for flexibility, scalability and cost savings
- redundant Pentium-based call processor core delivers up to 320 000 Busy Hour Call Completions (BHCC) supporting the most robust environments

Features and Benefits

- Nortel Meridian 1 portfolio of digital communication systems is a leader in the world marketplace. It is currently used by more business people than any other digital communications system.
- The modular architecture of every Nortel Meridian 1 system provides inherent flexibility and cost savings. The scalable, distributed processing and adherence to open standards allow a business to add capacity and features as needed and accommodates future advances in technology cost effectively and efficiently. The Nortel Meridian 1 offers an unparalleled with built-in evergreen investment protection. migration path to next-generation IP-based
- The Nortel Meridian 1 offers hundreds of software features and services, including basic and advanced voice and data communications, easy-to-use system administration capabilities, and an extensive array of call management, networking, and voice messaging features—powerful applications for maximum productivity.
- The value-added software features on the Nortel Meridian 1 offer a wide selection of options and a modular format that permits users to tailor the system software to their day-to-day operations and applications. The software feature options provide management tools to help allocate resources in a cost-effective manner and to improve productivity and time management.
- Nortel Meridian 1 systems feature high port density to minimize equipment, power, and floor space requirements. Digital line cards with 32 ports can support 16 Nortel Meridian digital telephones for voice and data communications over a single twisted-pair wire. You can configure software programmable universal trunk cards on site to support a variety of central office trunks such as CO, FX, and WATS and other trunk types including TIE, DID, recorded announcement and paging trunks. In addition, intelligent peripheral equipment (IPE) cards in the Nortel Meridian 1 off-load call-processing tasks and perform self-diagnostic tasks that reduce installation costs and improve operations.
- Nortel Meridian 1 provides a platform for applications such as unified messaging with Nortel Messaging, Nortel MDECT, wireless business systems, contact center with Nortel Contact Center - Manager and Nortel CTI Communication Server, data services and ISDN networking with primary rate and basic rate interface.
- Meridian 1 PBX brings integrated applications to the user's desktop (see Integrated Applications section in this Guide for details).
- The Nortel Meridian 1 offers an unparalleled migration path to next-generation IP-based solutions supported over a converged network. Enterprises that want to transform an existing Nortel Meridian 1 PBX into a converged IP PBX system can upgrade their existing Nortel Meridian 1 with the latest Nortel CS 1000 software and add an IP telephony signaling server for IP traffic and endpoint management. This transforms the Nortel Meridian 1 PBX into a hybrid solution, the Nortel CS 1000M. The Nortel CS 1000M is a reliable, high-performance system that can support up to 15 000 IP users per call server and provide hot-standby call server redundancy for critical applications. This hybrid solution, can support users with a combination of IP, digital, analog or wireless Voice over IP phones depending on business and application requirements.
- Nortel systems meet the highest standards for quality and reliability. The systems are built with the most advanced manufacturing processes, use the most current components, and incorporate the latest technological innovations to provide maximum system performance.
- The Communication Server 1000 Telephony Manager 3.0 manages Nortel systems. The CS1000 Telephony Manager is a PC-based administration tool for telephone additions, moves, changes, traffic analysis, reporting, and more with point-and-click simplicity.
- Nortel CSM supports open standards such as LDAP and SNMP. Telephone programming is as easy as clicking specific graphics. Web-based help files offer simple instructions on how to use the phones and features. Operations, administration, maintenance (OAM) and upgrades are performed using the Nortel CSM

or command line interface.

- The Nortel Meridian 1 PBX is easy to use. Nortel Meridian digital and IP telephones bring all the powerful features and services of the Nortel Meridian 1 PBX to each desktop in a company, helping employees communicate better and improving productivity companywide. Businesses can choose from a wide selection of real-time and multimedia applications to match the specific needs of each employee.
- They can choose from an application portfolio that includes a variety of business telephone configurations, customer engaging contact center and self help portals, messaging and unified messaging, desktop SIP-based collaborative multimedia applications, simplified OA&M with reporting, tracking and billing, network-wide seamless feature inter-operation, WAN-based solutions for branch integration, teleworkers, homebased and mobile employees, dynamic scalable security and secure wireless LAN deployments.
- The Nortel Meridian 1 PBX offers Nortel Messaging, so that individuals can manage all their communications instantly from a single centralized mailbox. Nortel Messaging combines voice mail, fax and e-mail on a single, powerful, easy-to-use messaging system allowing users to:
 - Create and send voice messages to one or many people.
 - Add a voice message attachment to a fax or e-mail.
 - Send and receive different message types from either a PC or a telephone.
 - Access all messages hands-free using simple voice commands.
 - Use Web-based access to messages.
 - Choose speech-to-text to read e-mail over the phone or cell phone.
- The Nortel Meridian 1 PBX can help you take full advantage of integrated services digital networking (ISDN), a set of standards for transmitting fully digital communications (voice, data, fax and image) over the same facilities. Today, networking includes centralized (shared) applications such as

attendants, call centers, messaging and call processing over circuit-switched or IP links, while adding seamless feature capabilities such as displaying a caller's name and the incoming phone number over a private network, call forwarding and conferencing, while providing a wide range of networking features.

- The Nortel Meridian 1 PBX uses IP telephony on demand. Companies can have server-based IP applications integrated with their existing network, such as CallPilot, Nortel Contact Center, Nortel MCS 5100, and CS1000 Telephony Manager 3.0. Companies can also have the newest IP solutions designed to save money and stay connected.
- Nortel Contact Center products improve operating efficiency with functionality that also provides the best in customer service. If a business relies on telephone inquiries, order taking and collections, the Nortel Meridian 1 PBX supports automatic call distribution and other call-handling software for unsurpassed customer service. These advanced and networked call center services offer skills-based routing to geographically distributed agents for 24-hour-a-day, 7-day-a-week operation. Easy graphical user interface (GUI) management and reporting gives businesses an in-depth analysis of a call center's operational efficiency, traffic, and revenue-generating capabilities. Nortel Contact Center is a full-powered, state-of-the-art, server-based, flexible, scalable solution to offer the best in customer relationship management.

Market Information

The Internet redefined the workplace by creating the ability to share and act on information in real time anywhere in the world. Every day, more people are communicating more information across a constantly growing network. The more your business expands, the more you need to extend your capabilities to compete and to succeed. Known for performance and reliability with more than 25 years of evolutionary and

revolutionary development, the Nortel Meridian 1 PBX delivers flexible, scalable, reliable, and responsive performance to keep you moving.

Technical Specifications

Platform	11C Chassis	11C Cabinet	61C	81C
Capacity	60–128 Expandable to 800 ports	Expandable to 800 ports	Expandable to 2 000 ports	Expandable to 16 000 ports
Memory	48 MB Flash, 16 MB DRAM	48 MB Flash, 16 MB DRAM	32 MB Flash, 48 MB DRAM	Redundant CP PII Flash not required 128 MB DRAM, five network groups or less; 256 DRAM six network or more
Call Processor	Motorola 68040	Motorola 68040	Redundant CP PII	Redundant CP PII
Mass Storage Media	Flash ROM integrated with CPU Software delivery using PCMCIA	System Core Card with Optional storage on PCMCIA	Redundant IODUC with one 3.5" 1.44 MB floppy disk drive; One 6 GB hard drive with CD ROM	Redundant Disk Units with one 3.5" 1.44 MB floppy disk drive; One 6 GB hard drive with CD ROM
I/O Ports	64	64	64	255
Busy Hour Call Completion	58 000 *	58 000 *	135 000 *	320 000 *
*Note: BHCC ratings are nominal only; actual capacity depends on software release, site configuration, and peripheral type.				
Trunking	Analog: Loop or Ground Start CO, FX, WATS, 2 or 4 wire E&M or 4-wire DX, DID, TIE, RAN, Paging, IP Trunk Gateway. Digital: DTI, ISDN-PRI, (T1 & E1) ISDN-BRI, DPNSS, DASS IP: Internet telephony gateway trunk; DPNSS-PRI, IP peer virtual trunking; IP signaling server.			
Telephone Compatibility	Digital: M3900 Series – 3901, 3902, 3903, 3904, 3905 M2000 Series – M2000, M2006, M2008, M2008HF, M2616, M2216ACD, M2016S IP Phones: - IP Adapter for Digital Telephones; IP Phones 2001, 2002, 2004, 2007, 2033, IP Softphones 2050, MVC 2050 Analog: M8000/M9000 Series 500/2500 type.			
Attendant Services Position	M2250 Attendant Console Multiline Central Answering Compatibility (ML-CAP).			
IP Gateways Supported	IP Trunk Gateway and IP Line Gateway.			
e-mobility	802.11 Wireless IP Gateway for Meridian 1-24 ports; supports H.323 standard with Nortel Extensions and more for advanced telephony features G.711 and G.729 codecs.			
Contact Center Support	Nortel Contact Center Manager: configurable up to 3000 agents with up to 1500 actively logged on (subject to capacity analysis) Nortel Contact Center Express: up to 300 agents with up to 175 logged on (subject to capacity analysis)			
Nortel Self Service	maximum capacity of VPSis is 15 000 ports (configuration dependent)			

Integrated Applications	Integrated Conference Bridge; Integrated Personal Call Director, Integrated Call Assistant, Integrated Voice Services, Integrated Recorded Announcer			
Remote Solutions	9150, 9115, Survivable IP Expansion	9150, 9115, Survivable IP Expansion, Mini Carrier Remote 9150, 9115, Fiber Remote, Fiber Remote Multi-IPE, Mini Carrier Remote, Carrier Remote		
CallPilot Messaging	CallPilot 201i – 200 hours, 24 channels, up to 8000 mailboxes CallPilot 201i – 200 hours, 24 channels, up to 8000 mailboxes CallPilot Tower and Rack – 1000 hours, 96 channels, up to 20 000 mailboxes			
Network Management	CS1000 Telephony Manager 3.0			
Input Voltage	ac: 110 to 240V, 50/60 Hz	ac: 110 to 240V, 50/60 Hz dc: –42 to –54V	ac: 180 to 280V 50/60 Hz; dc: –40 to –56.6V ac: 180 to 280V 50/60 Hz; dc: –40 to –56.6V	
Dimensions	Main/Expander Chassis Weight empty: 12 kg (26.4 lb) Weight full: 14.6 kg (32.2 lb) Width: 43.9 cm (17.3 in.) Depth: 32.6 cm (12.8 in.) Height: 32.6 cm (12.8 in.) 2.14 cm (8.4 in.) Up to ten 19 in. rack-, wall-, or desk-mountable chassis are allowed per system	Main Cabinet/ Expander Cabinet: Weight empty: 12 kg (26 lb) Weight full: 31.7 kg (70 lb) Width: 55.9 cm (22 in.) Depth: 30.5 cm (12 in.) Height: 63.5 cm (25 in.) Up to five wall-mountable cabinets or 1 cabinet, 8 chassis per system (1 cabinet = 2 chassis)	Pedestal/Module/ Top Cap Weight Empty: 18.2 kg (40 lb), 22.7 kg (50 lb), or 6.8 kg (15 lb) Weight Full: 31.8 kg (70 lb), 59 kg (130 lb), or 6.8 kg (15 lb) Width: 81.2 cm (32 in.), 81.2 cm (32 in.) or 81.2 cm (32 in.) Depth: 66 cm (26 in.), 55.9 cm (22 in.), or 55.8 cm (22 in.) Height: 25.4 cm (10 in.), 43.2 cm (17 in.), or 10.1 cm (4 in.)	

Ordering Information

For further information, contact your local Nortel representative.

IP Line Card

Overview

Internet protocol (IP) Line software supports the deployment of IP phones in Nortel Meridian 1 PBXs and Communication Server 1000 networks, delivering feature- and application-rich telephony services over a single Ethernet connection. Working in conjunction with Nortel Voice Gateway Media Cards, Nortel IP Line Cards or a Nortel Communication Server 1000 (CS 1000) Signaling Server, provide gateway functionality for bridging packet-switched and circuit-switching, and acts as a terminal proxy server for IP phones.

Ideal For

- Any enterprise that wants a hybrid mix of IP, digital, and analog phones to maximize its communications investment.
- Businesses with an existing Nortel Meridian 1 PBX that want to incorporate IP telephony on a small scale. Deploying Nortel IP Line cards represents the smoothest, most cost-effective route to IP convergence for the installed base of 43 million Nortel Meridian 1 PBX users. As enterprises begin to scale their IP telephony deployment beyond a few IP phones, they can easily migrate their Nortel Meridian 1 to a Nortel CS1000 with scalability to 10 000 IP phone per server; in this case, Nortel IP Line Cards are redeployed as DSP resource cards.
- Early adopters who want the latest technology on the leading communications system.
- Companies that want to incrementally expand their network by adding new sites or by adding new users.
- Companies that have a large number of additions, moves and changes.
- Remote workers that need to access their corporate data and voice services in exactly the same way, whether in the office, at home, or on the road.

Business Challenges

- Do you want alternative ways to support remote workers?
- Are you interested in offering more choices to your desktop users?
- Does your site have an extensive number of additions, moves, and changes?
- Are you considering deploying IP phones?

Typical Applications

Nortel IP Line software is an important element of the Nortel converged communication enterprise portfolio because it facilitates the convergence of

voice and data by deploying telephony communications over a data network. Enterprises building a new site can wire for a single network versus wiring separately for voice and data. Enterprises can implement a Nortel Meridian 1 or Nortel CS 1000 with 100 percent Nortel IP phones or can deploy Nortel IP Phones with digital and analog phones. Nortel IP Line software is particularly beneficial in environments where frequent adds, moves and changes occur, and in environments with a geographically distributed or mobile workforce (remote offices, telecommuters, field workers, traveling workers). For example, the Nortel IP Softphone 2050 runs on a PC and provides the same features and services as a desktop phone. Nortel IP Phones such as the Nortel IP Phone 2004, 2002, and 2001 operate over any Ethernet connection with plug-and-play ease.

Key Points

When deployed with Signaling Server, the IP Line Card allows communication with SIP and H.323-based IP telephony devices.

- provides support for IP phones connected to feature and application-rich telephony servers (Nortel CS 1000/1000M and Nortel Meridian 1)
- co-existence of Nortel IP Phones with digital and analog phones on Nortel CS 1000 and Nortel Meridian 1, for migration to IP telephony at a pace appropriate to business requirements
- supports standards-based layer 2 and 3 quality of service (QoS) to maintain high voice quality over any QoS-capable data network
- part of the Nortel WLAN IP telephony solution
- reduced communications costs using converged communications network
- excellent migration path to IP telephony and ROI extension for existing Nortel Meridian 1 systems

- Full access to Nortel Meridian 1 and Nortel CS1000 suite of enterprise communications features and applications

Features and Benefits

- enables communication between a circuit-switched telephony network and IP clients
- phones supported include Nortel IP Phones 2004, 2002 and 2001; Nortel IP Softphone 2050, Nortel Mobile Voice Client 2050 and Nortel WLAN Wireless Handset 2210², 2211 and 2212
- increased choice and flexibility in providing desktop voice capability for campus and remote users
- uses existing data network infrastructure (data and voice convergence)
- enables smooth rollout of IP telephony services building on the existing voice network
- load balancing so IP phones can use a pool of DSP gateway resources
- simplified network management and support costs
- simplified moves, additions and changes through support of DHCP
- builds on the reliability and feature richness of the Nortel Meridian 1 and Nortel CS 1000 systems
- complies with open standards, including standard codecs (G.711, G.723.1, G.729B, G.729AB)
- consolidation of network services resulting in savings

Market Information

IP Telephony is gaining momentum as many companies see the benefits of converging voice and data. Nortel IP Line and Trunk Cards reduce your communications and support costs by using the converged architecture. Integrating voice, data, and multimedia creates a global network that delivers great cost benefits with a scalable architecture.

Ordering Information

For further information, contact your local Nortel representative.

IP Trunk Card



Overview

With today's widespread deployment of Internet protocol (IP) networks, organizations want new ways to maximize their investments by converging voice and data network infrastructures. Nortel IP Trunk is IP telephony gateway software for the Nortel Meridian 1 PBX that runs on an IPE card and converts real-time voice and fax information into IP packets. As a result, the Nortel Meridian 1 networks over an IP WAN (wide area network) or IP MAN (metropolitan area network) to other Nortel Meridian 1, Business Communications Manager 50/200/400, and Nortel Communication Server 1000 systems. Nortel IP Trunk software provides an integrated solution for high-quality voice transmission over an IP network with the benefit of ISDN networking features. It allows Nortel Meridian 1 to migrate to IP telephony while preserving features, applications, and reliability. Enterprises can incorporate IP telephony into their networks at a pace that corresponds to their business requirements.

Ideal For

- new and existing multisite organizations with Nortel Meridian 1 systems that need to network to other Nortel Meridian 1, Business Communication Manager 50/200/400 or Nortel Communication Server 1000 systems
- international sites, already connected by IP data networks, that want to save money by using IP telephony toll-bypass
- organizations that pay high per-minute charges for local calls between sites by using IP telephony as a low-cost alternative to PSTN calls
- multisite organizations that need additional signaling between sites for feature-enabling and sharing of centralized resources (such as voice mail)
- organizations with sites already interconnected by both an IP network and multiple point-to-point tie lines
- multisite organizations interconnected by high-speed IP networks (MAN or optical)

Business Challenges

- Do you want feature transparency across your multi-site organization?
- Are you considering ways to reduce costs using an alternative to PSTN service?
- Are you interested in using IP telephony toll bypass?

Typical Applications

Nortel IP Trunk software is an important element of the Nortel converged communication enterprise portfolio because it facilitates the convergence of

voice and data on the Nortel Meridian 1 system. With this product, you can use an existing IP-based data network for voice and fax traffic. Because Nortel IP Trunk software supports ISDN signaling, organizations can take advantage of productivity enhancers like network-wide calling party name and number display. You can use centralized access to powerful Nortel Meridian 1 services, like Nortel Messaging and attendant services, network-wide through support of ISDN.

Key Points

- The Nortel IP Trunk Card provides IP telephony with feature transparency including centralized and networked applications between Nortel Meridian 1, Nortel Communication Server 1000, and Nortel Business Communication Manager 50/200/400 systems.
- Migration to IP telephony is transparent to the end user as no change in dialing sequence or feature operation is necessary.
- You can install the Nortel IP Trunk card neatly into an existing Nortel Meridian 1 shelf and easily manage the card using Nortel Meridian 1 automatic least-cost routing tables (NARS/BARS).
- The Nortel IP Trunk card does not require a dedicated connection between each system; Nortel IP Trunk resources are shared across the network.
- The Nortel IP Trunk hardware delivers carrier-class reliability with resource pooling and redundancy.
- Nortel provides the Nortel IP Trunk capability to

enable customers to deploy IP telephony across an existing IP WAN infrastructure, while preserving their investment in existing systems.

- Nortel IP Trunk software quickly IP-enables all existing Nortel Meridian 1 phones for site-to-site IP telephony traffic, while seamlessly integrating with the PBX features and functions. Organizations can deploy multisite IP telephony with no user retraining and with no installation of poorly integrated (and high administrative cost) or external devices, and still maintain access to all PBX features and functions needed for maximum flexibility and efficiency.
- Nortel IP Trunk products eliminate the worry of a "forklift" upgrade and cut-over to a completely different IP-based system that can have unknown or missing features and that can require user and administrator retraining, without losing the significant investment made in telephone sets and related equipment. Instead, Nortel IP Trunk products allow IP trunking without replacing the remainder of the installed infrastructure.

Features and Benefits

With the Nortel IP Trunk capability enterprises can reduce communication costs by network consolidation because a single network infrastructure can support both the voice and data networking requirements of offices at various locations. Routing voice calls over existing IP network facilities saves costs by avoiding per-minute call charges on voice calls, faxes, and voice messaging.

The Nortel IP Trunk software solution compresses pulse code modulation (PCM) voice, demodulates group 3 faxes and routes the packetized data over a private Intranet. The organization must have installed a corporate IP network and routers available for WAN connectivity between networked systems. Also required, are 100/10baseT Ethernet interfaces to the Nortel Voice Gateway Media Card or Nortel IP Trunk Card, as well as support of IP version 4

network layer and addressing in the WAN. No restriction exists on the physical medium of the WAN. The Nortel IP Trunk software solution includes ISDN D-channel for enhanced signaling between Nortel Meridian 1, Nortel Communication Server 1000, and Business Communications Manager 50/200/400 systems, allowing them to be networked. The Nortel IP Trunk software solution uses ISDN protocols with H.323 signaling and voice over a standard IP protocol stack. Nortel IP Trunk 3.0 runs on both the single-slot Nortel Voice Gateway Media Card (32-port) and the dual-slot ITG-Pentium card (24-port). Nortel IP Trunk 3.0 on these cards can also place and receive calls from systems running previous installations of Nortel Internet Telephony Gateway Trunk.

Operations, administration and maintenance (OAM) use the Nortel Optivity Telephony Manager. Nortel Meridian 1 X11 Release 25, or Nortel Communication Server 1000 Release 3.0 or later software is required.

Nortel IP Trunk software provides the following benefits:

- sharing of centralized applications across an IP telephony network, increasing efficiency and customer satisfaction, while reducing costs:
 - centralized voice mail (Nortel Messaging) with multiple branch offices over an IP WAN, including message-light notification over the IP network
 - network-wide attendant service attendants for answering calls from any site on the network
 - Network-based ACD allows multiple call centers to operate as a single coordinated resource
- network-wide features available for all calls across the network are preserved when calls are transferred or forwarded:
 - calling-line ID
 - caller name display
 - call park and call retrieve
 - ISDN, MCDN and H.323 signaling features
 - reduced communications and support costs

- using converged architecture
- operates transparently to the end user when routing over the IP data network
- simple installation and maintenance using Nortel CS1000 Telephony Manager 3.0 software
- integrated with automatic route selection features of the Nortel Meridian 1
- complies with standard codecs (G.711, G.723.1, G.729B, G.729AB)
- supports standards-based layer 2 and 3 quality of service (QoS) to maintain high voice quality over a busy IP network

Ordering Information

For further information, contact your local Nortel representative.

Nortel Large Meridian Platform

Large organizations with the most demanding requirements for capacity, reliability, advanced applications and sophisticated networking turn to the Nortel Meridian SL-100. The Meridian SL-100 platform offers carrier-grade services to an enterprise with large line requirements or to a campus environment that requires a central facility to serve a number of medium and large remote sites.

Nortel Meridian SL-100



Overview

The Nortel Meridian SL-100 is the largest member of the Nortel Meridian family of enterprise communications systems. The Nortel Meridian SL-100 is ideal for large enterprises that require a carrier-grade system and services that can meet medium to large line requirements or a campus environment with a large central facility that serves a number of remote locations.

The Nortel Meridian SL-100 combines the advanced hardware and software architecture of the Nortel DMS-100 switching system with the premier PBX software features of the Nortel Meridian 1 into a single enterprise solution. The carrier features of the DMS-100 combined with the enterprise features of the Meridian 1 provide a powerful platform of services to meet unique business requirements. Two options are available: the Nortel Meridian SL-100 SuperNode SE with a 50 000-port capacity and Nortel Meridian SL-100 SuperNode designed for a higher capacity (up to 100 000 ports).

Ideal For

- Large organizations with the most demanding requirements for capacity, reliability, advanced applications, and sophisticated networking.
- Campus environments that require a central facility to serve a number of medium to large remote sites.
- Large government departments with special requirements (for example in the U.S. Department of Defense locations that require a Defense Switched Network [DSN] certification through the Joint Interoperability Test Command [JITC]).
- Other organizations that benefit from the capabilities of Nortel Meridian SL-100 include education, finance, health care, governments, hospitality, and multitenant services.

Business Challenges

- Do you require carrier grade services, features, and reliability?
- Does your organization need more than 4000 extensions?
- Does your organization have a campus environment that needs to support large remote locations?
- Is your organization considering changing from a carrier-provided Centrex service to privately provided services?
- Are unique military features and certifications required?

Typical Applications

- By combining the best of Nortel carrier and enterprise capabilities, the Nortel Meridian SL-100 can serve all the total communications

needs that support a single large site or campus environment that supports up to 100 000 ports.

- When this system is deployed as an end office (EO) or multifunction switch (MFS) in the Defense Switched Network then the system provides the certified unique military features required by the United States military.

Key Points

- **Proven reliability:** 99.999 percent reliability is delivered using Nortel carrier-based architecture as the foundation for the Nortel Meridian SL-100.
- **Flexibility:** The Nortel Meridian SL-100 provides both carrier and Meridian 1 business features in a single enterprise solution to deploy the features where the organization needs them.
- **Investment protection:** As a business grows and changes, Nortel Meridian SL-100 systems and applications can grow along with it—from 4000 to 100 000 ports.
- **Proven track record:** Nortel Meridian SL-100 has delivered the valued features and applications to businesses for more than 20 years.
- **Modular architecture:** Modular architecture provides inherent flexibility and cost savings.
- **Powerful networking features:** These features are available for the public switched telephone network (PSTN), private and virtual private network access.
- **Migration to future technology:** You can migrate Nortel Meridian SL-100 systems easily

to the Communication Server 2100 to accommodate new IP Telephony advantages. If migrated, the Core Call Server performs call processing for existing Meridian SL-100 components in parallel with media gateways and IP end-points, maximizing current investments.

- **System:** supports a range of telephone sets including analog, Meridian digital and Meridian business sets.
- **Military unique features:** The Meridian SL-100 is certified in the U.S. by the Defense Information Systems Agency to provide the military unique features for the United States Government Defense Switched Network.

Nortel Meridian SL-100 Software SE09 Features for Meridian SL-100 and Communication Server 2100

Software Release SE09 (SE09) is supported on both the Communication Server 2100 and Meridian SL-100 systems. SE09 brings many enhancements that are aimed at reducing the overall cost of the solution as well as simplifying the architecture, administration and management. SE09 continues to build on prior releases with improvements in reliability, and specifically security of the Communication Server 2100. Automatic Call Distributor (ACD) capacities continue to be increased to support call center consolidation initiatives for Meridian SL-100 or Communication Server 2100 customers. SE09 introduces support for the Nortel WLAN Handsets to improve employee productivity, specifically in vertical markets such as health care, education, and manufacturing.

Meridian SL-100 customers currently using the Extended Architecture Core (XA-Core) processor can easily upgrade to the Communication Server 2100 by adding a network interface card into the XA-Core shelf and implementing software release SE06 or later. Once on the Communication Server 2100 platform, customers can use the many additional benefits offered. Customers can easily and quickly add IP Clients, line gateways, or trunks gateways to the network as required.

These additions can maximize existing investments and provide the flexibility to continue to deliver TDM today and to implement IP telephony as needed.

Nortel incorporates the following new features and capabilities into SE09 for the Meridian SL-100 and Communication Server 2100:

- **General features**
 - IP Client Manager (IPCM) call state enhancements
 - Multitime-zone (Network class of service [NCOS] and time-of-day [TOD] feature interaction)
 - T.38 fax over Session Initiation Protocol (SIP) trunk
 - Universal Signaling Point enhancement
- **Capacity enhancements**
 - Automatic Call Distributor (ACD) and ICM capacity increases
 - Border control point 7200
- **Media gateways**
 - Combine profiles on Gateway Controller (GWC)
- **IP client devices**
 - WLAN Handset 2210, 2211, and 2212
 - IP Phone 2001 user enhancements
- **Applications**
 - Redundant ICM links
- **Performance enhancements**
 - Media Gateway (MG) 15000 REXtst enhancement
- **Security enhancements**
 - H.248 xUA Network Address Translation (NAT) traversal
 - Transport layer security (TLS) for Session Initiation Protocol (SIP) trunks
 - Operations Administration Maintenance (OAM) security enhancements
 - Border control point 7200
- **Operations Administration Maintenance and Provisioning (OAM&P) Management**
 - Integrated Element Management System (EMS) support for Media Gateway (MG) 3200
 - Multi-service Data Manager (MDM) standardization
 - Core and billing manager patching

enhancement

- IP Client Manager patching enhancement
- Electronic Software Delivery (ESD) support for SSPFS
- Synchronized backup enhancement
- Integrated EMS remote ping and Traceroute utilities
- Transport layer security (TLS) for Session Initiation Protocol (SIP) trunks
- Operations Administration Maintenance (OAM) security enhancements
- Border control point 7200

Features and Benefits

The Nortel Meridian SL-100 supports many applications available to the Nortel Meridian 1 family including unified messaging with CallPilot, contact centers with Nortel Contact Center Manager, and multimedia applications with the Multimedia Communication Server 5100. These services can be hosted centrally and extended across the network to remote locations served by the Nortel Meridian SL-100.

- The Nortel Meridian SL-100 offers hundreds of software features and services, including basic and advanced voice and data communications, system administration capabilities, and an extensive array of call management, networking, and voice-messaging features—powerful applications for greater productivity.
- Nortel Meridian SL-100 provides a platform for applications such as Nortel unified messaging solutions with CallPilot, contact center with Nortel Call Center Server, multimedia applications with Multimedia Communication Server 5100, ISDN networking with Primary Rate (PRI) and Basic Rate Interface (BRI) and Signaling System 7 (SS7).
- The value-added software features on Nortel Meridian SL-100 offer a wide selection of options and a modular format that permits a business to tailor the system software to meet day-to-day operations and applications.
- The modular architecture of every Nortel Meridian SL-100 system provides inherent flexibility and cost savings. The scalable, distributed processing, adheres to open standards so a business can add capacity and features as they require to accommodate future advances in technology cost-effectively

and efficiently with built-in "evergreen" investment protection.

- The Nortel Meridian SL-100 supports the Nortel Remote Gateway 9100 Series.
- The Nortel Meridian SL-100 supports the Integrated Conference Bridge application.
- The Nortel Meridian SL-100 supports the M3900 Series Digital Telephones.
- The Nortel Meridian SL-100 provides industry-leading business (CLASS) and residential features.
- Advanced and unified messaging features are provided using CallPilot.
- The Nortel Meridian SL-100 offers revenue-generating call center capabilities using Nortel Contact Center - Manager.
- Nortel systems meet the highest standards for quality and reliability. These systems have the most advanced manufacturing processes, use the most current components, and incorporate the latest technological innovations to provide maximum system performance.

Market Information

In a world in which the workplace is redefined daily, the ability to share information in real-time is critical. Every day more people communicate across constantly growing enterprise networks. To keep pace with this change, your communications system needs to keep pace. Nortel Meridian SL-100 offers scalable, flexible, and reliable performance to keep your business moving. Whether you select the SuperNode SE system or the larger SuperNode system with its 100 000-port capacity, you have proven and powerful performance for your communications. The Meridian SL-100 has true, built-in redundancy from top to bottom, which is why you find the Meridian SL-100 in the switch rooms of Fortune 100 companies across the United States—environments where reliability and service cannot be compromised. Nortel demonstrates leadership and commitment to our enterprise partners. Large enterprises of all types (including education, finance, health care, government, utilities, manufacturing, and service) use the advanced capabilities of the Meridian SL-100 communications system to accelerate profitability and success.

Technical Specifications

Meridian SL-100	SuperNode	SuperNode SE
Call Processor	XA Core: Single Shelf Containing: Processor Element (PE) Power MPC7410/500 MHz. Duplicated per PE for fault detection. 512 MB on-board memory for Program Store. Scalable Real-time in-service addition of PEs. Scalable Reliability - "n+m" reliability. Input/Output Processors Common Host I/O Processors (IOP). Individual personality "Packets" - two per IOP. OC-3/ATM MS Links. Remote Terminal Interfaces (RS-232). Provisionable mass storage devices: >= 4 GB disks; 1.3-4 GB DAT. Fault Tolerant File System. Shared Memory (SM) Shared Data Store, Master Copy of Program Store. Duplex memory; independently mated 32 MB blocks. Hot spare for reliability. 192 MB granularity; 1728 MB capacity.	
Line Capacity	60 000	36 000
Total Port Capacity	100 000	50 000
Telephones Supported	Analog Sets All Digital Sets M2000 series sets M3900 series sets M5000 series sets	
Operating Environment Power Consumption	Call Control Frame Power — 2500 watts or 8540 BTU/hour Current Drain — 56.2 Amps Nominal Voltage — 50.25 Volts OAM&P Cabinet Power — 1650 watts or 5.640 BTU/hour Current Drain — 32.5 Amps Nominal Voltage — 50.25 Volts SuperNode Data Manager Cabinet Power — 870 watts or 3 980 BTU/hour Current Drain — 17.2 Amps Nominal Voltage — 50.25 Volts Note: Power consumptions vary depending on the actual components housed in each cabinet.	
Dimensions	C42 equipment cabinet Height: 183 cm (72 in.) Width: 107 cm (42 in.) Depth: 71 cm (28 in.) Houses: XA-Core, Message Switch, ENET C28 equipment cabinet Height: 183 cm (72 in.) Width: 107 cm (42 in.) Depth: 71 cm (28 in.) Houses: SuperNode Data Manager, Integrated Service Module/Input/Output Module Open Frame Height: 213 cm (84 in.) Width: 72 cm (28 in.) Depth: 46 cm (18 in.) Houses: SuperNode Data Manager, Integrated Service Module/Input/Output Module	

Ordering Information

For further information, contact your local Nortel representative.

Nortel Digital Desktop Portfolio

The Nortel series of digital telephones for the Nortel Meridian 1, SL-100, Communication Server 1000, and Communication Server 2100 platforms brings user-friendliness and extensive features to the desktop. To meet the needs of organizations of all sizes, the Nortel M3900 Digital Telephone series offers five telephone models and various accessories. In business, the first point of contact with customers is often your contact center attendant. The attendant's ability to process calls efficiently and effectively through the organization can mean the difference between a repeat customer and a lost sale.

- Nortel Meridian 3900 (M3900) Digital Telephones
 - M3901 Entry Telephone
 - M3902 Basic Telephone
 - M3903 Enhanced Telephone
 - M3904 Professional Telephone
 - M3905 Call Center Telephone
- Nortel Digital Attendant Positions and Accessories
 - Meridian M2250 Digital Attendant Console
 - PC Console Interface Unit (PC CIU)

Nortel M3900 Digital Telephone Series

Overview

The Nortel M3900 Digital Telephone series brings easily and cost-effectively a wide range of new features and capabilities to the desktop. The Nortel M3900 series is the Nortel latest range of digital telephones for the Nortel Meridian 1, SL-100, Communication Server 1000, and Communication Server 2100 platforms.

The Nortel M3900 series consists of five telephone models and various accessories to meet the diverse needs of all organizations. The Nortel M3900 series delivers excellent voice quality, simplicity of use, and ease of management.

Ideal For

- M3901 Entry Telephone: designed for users who require essential telephony functionality, this single-line entry-level phone is ideal for common areas with low call activity levels such as reception areas, hallways, classrooms, lobbies, cafeterias, and restaurants.
- M3902 Basic Telephone: designed for users who require basic telephony functionality, this phone is ideal for a manufacturing floor, warehouse, and other areas that require light telephone use.
- M3903 Enhanced Telephone: designed for users who require enhanced telephony functionality, this multiline phone with a display screen is ideal for office professionals and technical specialists in moderate call-activity environments.
- M3904 Professional Telephone: designed for managers, executives, and office administrators with high-call volumes, this multiline phone features a large LCD screen to maximize information presentation.
- M3905 Call Center Telephone: designed specifically for a call center environment, this phone is ideal for Automatic Call Distribution (ACD) environments along with contact center agents and supervisors.

Business Challenges

- Does your organization want flexibility and choice for the digital telephone solutions on the users' desktops?
- Does your organization have a variety of user types, each with diverse needs?
- Does your organization want value and low

cost of ownership in its digital telephone portfolio?

Key Points

- lower cost of ownership
- self-labeled keys
- simplified administration, upgrades, and maintenance
- simplify accessories installation
- increased user productivity through simplified user interface
- enhanced to directory search to make calling easy and finding numbers fast
- efficient access to value-added features and services
- context-sensitive keys for easy viewing of line and feature status
- increased flexibility with many custom virtual office features

Features and Benefits

- **Full duplex handsfree accessory cartridge:** M3904 full-duplex handsfree functionality (FDHF) allows two-way communication during a handsfree call.
- **One button feature access:** direct access to soft-key-based features such as the callers list, redial list, and personal directory.
- **Corporate directory search enhancement:** the resume soft key is available on the corporate directory screens of the Nortel M3903, M3904, and M3905 phone sets. Press the resume key return to the corporate directory find screen to enter additional characters and to continue searching without starting over.
- **System-initiated language selection:** the system administrator can define a default

language on a customer basis for Nortel M3902, M3903, M3904, and M3905 phone sets. The system administrator defines the default language that applies to all new Nortel M3900 sets configured for the customer group.

- **Set-to-set messaging enhancements:** the system administrator can predefine ten messages for the Nortel M3903, M3904, and M3905 phone sets. The telephone user can select one message as a set-to-set message. Telephone users can edit a message before selecting it to be the set-to-set message.
- **31-digit dialing:** the Nortel M3900 display screens accommodate dial strings of 31 digits to allow the screen to fully display long dial strings such as calling card numbers and access codes.
- **Special character support:** Nortel M3902, M3903, M3904, and M3905 sets support for the special characters found on a PC keyboard. Special characters are available in edit mode in the personal directory and in set-to-set messaging. For example, users can enter names with an accent in their personal directory (for example, José).
- **PC Utility software:** the personal directory PC Utility provides a quick, easy way to create or modify a personal directory for a Nortel M3904 and M3905. A user can enter names and numbers into a personal directory file on a PC and download the file directly from the PC to the Nortel M3904 or M3905 telephone through a serial port connection on a cartridge-style accessory. A user can also read a directory from a Nortel M3904 or M3905 to a PC and modify the directory.
- **Computer telephony interface adapter:** the computer telephony interface adapter (CTIA) is a cartridge-style accessory with software that enables PC applications to monitor or control the Nortel M3900 Telephone for first-party call control-type applications. It integrates the PC and telephone, to allow a user to manage calls effectively using a PC application such as Microsoft Outlook. The CTIA comes with the Desktop TAPI service provider software. The PC software application required to complete the package is not provided.
- **Desktop TAPI service provider software:** TAPI-compliant applications usually support placing calls, answering calls, holding and releasing calls, transferring and conferencing calls, as well as other features. However, one of the most important functions of the TAPI service provider is interpreting the information on the telephone display and passing that information to a TAPI application.
- **Display-based expansion module:** display-based accessory (DBA) is an expansion module that provides a single strip of eight additional keys for the M3904 and M3905 telephones. The user presses the Page Key on the DBA to access three different layers of keys. A single DBA can be configured to provide up to 24 soft-labeled programmable line/feature keys (eight keys on each of the three layers).
- **Key-based expansion module:** the key-based accessory (KBA) attaches to the M3904 and M3905 telephones. The KBA provides 22 additional line and feature keys. You can attach a maximum of two key-based expansion modules to the M3904 and M3905.
- **Analog terminal adapter:** the analog terminal adapter (ATA) lets you connect an analog device such as a fax machine or modem to your telephone. You can have simultaneous use of the telephone and the analog device. The ATA is available for the M3902, M3903, M3904, and M3905 models.
- **External alerter and recording interface:** the external alerter and recording interface provides an interface for a remote ringer device installed in a location separate from the telephone. The external alerter and recording interface provides access to a standard, off-the-shelf remote ringer, call status relay, audio recorder, or visual indicator.
- **Full icon support:** instead of a flashing icon, the distinctive functional icons along with the expansion modules provide quick, easy understanding of the status of a call.

Model	Features	Typical Applications:
Nortel M3901 	• Entry-level single line set • 5 programmable features • 4 fixed keys (line, feature, hold, goodbye) • Ringing and handset volume control • LED indicator: message waiting, feature activation • Feature card • Desk- or wall-mount	Low volume areas such as reception lobby, hallways, and cafeterias
Nortel M3902 	• Basic single-line set • 1-line x 24-character display • 3 self-labeling programmable feature keys • Handsfree key with LED • Navigation cluster • Desk- or wall-mount • Headset support	Manufacturing floor, warehouse, light telephone use
Nortel M3903 	• Multiline • 2-line x 24-character display • 2 self-labeling programmable line and feature keys • 4 context-sensitive feature keys • Advanced feature access: virtual office, corporate directory, set-to-set messaging • Fixed feature keys: direct connect headset, message, call log (including redial list), applications, shift, "smart" mute with LED, headset with LED, hold, goodbye, volume control and redial list (10/5) • Handsfree with LED • Navigation cluster, quit and copy • Desk- or wall-mount	Office professionals, technical specialists

Nortel M3904 	• Multiline • 3-line x 24-character display • 6 self-labeling programmable line and feature keys • 4 context-sensitive feature keys • Advanced feature access: virtual office, corporate directory, set-to-set messaging • Fixed feature keys: message, directory and log (includes personal directory, call log, and redial list), applications, shift, "smart" mute with LED, headset with LED, hold, goodbye, volume control • Direct connect headset • Handsfree with LED • Navigation cluster, quit, and copy • Desk- or wall-mount	Managers, executives, administrative assistants
Nortel M3905 	• Multiline • 2-line x 24-character display • 8 self-labeling programmable line and feature keys • 4 self-labeled programmable feature keys • 6 ACD fixed feature keys with LED, headset, supervisor, emergency, make busy, not ready, in-calls • Supervisor plug in key (talk or listen only) • Navigation cluster, quit, and copy • Dual headset jacks • Handset optional • 2 accessory ports	Contact center agents and supervisors Nortel Contact Center agents and supervisors

Market Information

The Nortel M3900 series delivers highly valued features and functionality to users while serving as a platform for ongoing enhancements and IP migration.

Technical Specifications

	Nortel M3901	Nortel M3902	Nortel M3903	Nortel M3904	Nortel M3905
Platform compatibility	Nortel Meridian 1, Meridian SL100 systems, CS1000, and CS2100				
Colour	Charcoal or Platinum				
Power supply	Loop powered from system up to 1067 m (3500 ft)				
Operating Temperature	0°C to 50°C (32°F to 104°F)				
Relative humidity	5% to 95% (noncondensing). At temperatures above 34°C (93°F) relative humidity limited to 53 mbar of water vapor pressure				
Storage Temperature	-50°C to 70°C (-58°F to 158°F)				
Headset support					
Direct connection of a third-party headset through a socket on back of set	-	-	X	X	-
Direct Connection of a third-party headset through two sockets on back of set	-	-	-	-	X
Mounting	Desktop or wall				
Supported accessories					
ATA	-	X	X	X	X
CTIA	-	X	X	X	X
external alerter and recording interface	-	X	X	X	X
personal directory PC utility	-	-	-	X	-
key-based accessory module and display-based accessory module	-	-	-	X	X
Software release	Release 24 or later; Nortel CS1000 Release 3.0 or later	Release 25 or later; Nortel CS1000 Release 3.0 or later	Release 25 or later; Nortel CS1000 Release 3.0 or later	Release 25 or later; Nortel CS1000 Release 3.0 or later	Release 24 or later; Nortel CS1000 Release 3.0 or later

Ordering Information

For further information, contact your local Nortel representative.

Meridian M2250 Digital Attendant Console and PC Console Interface Unit



Overview

The Meridian M2250 Digital Attendant Console is a powerful, digital attendant console that delivers efficient, high-speed call processing. The M2250 transforms the attendant position into an efficient call answering and message center with advanced capabilities to help manage and streamline attendant services. Advanced features are easily configurable to support your company requirements and to give attendants flexibility to handle calls effectively.

For customers who want the features and capabilities of the Meridian M2250 Digital Attendant Console with the flexibility of a PC-based console, the PC Console Interface Unit (PC CIU) is the solution.

Ideal For

- The Meridian M2250 Digital Attendant Console provides the attendant operator with an easy-to-use tool that provides maximum efficiency.
- The PC CIU provides options to customers who prefer to handle incoming calls using a PC.

Typical Applications

Enterprises seeking to centralize call answering.

Key Points

Meridian M2250 Digital Attendant Console

- **Display:** large, easy-to-read indicators and a built-in 4-line by 40-character liquid crystal display. The display presents the essential information required for prompt call processing and professional call answering and screening. Both the display and the angle of the keyboard are adjustable so attendants can choose the most comfortable viewing and operating angle.
- **Supervisor capabilities:** allow a supervisor to monitor attendant calls in progress and override the attendant position busy status.
- **Programmable feature keys:** support up to 20 features, such as Busy Verify, Call Park, Auto Dial, and Paging.
- **Centralized Messaging:** with the Meridian M2250 Digital Attendant Console, messaging can be centralized at the console, to free attendants for other duties. An indicator on the telephone notifies an employee that messages are waiting. Lost or delayed messages are virtually eliminated.
- **The Options Menu:** permits attendants to customize several console features, such as

contrast adjustment, volume settings, and language.

- **Call Party Name Display:** provides the name and extension number of each caller within your system. Attendants know if the call is internal or external and can respond accordingly.
- **Attendant Administration:** allows the attendant to modify certain features assigned to the telephones in the office. A plastic overlay is used to guide attendants through the operation, making it quick, easy, and cost-effective to modify features as business needs change.

PC Console Interface Unit (PC CIU)

- connectivity between CS1000 or Meridian 1 and the PC-based attendant software via RS-232 connection to a customer provided PC
- connectivity alarm monitoring
- Dual hand- and headset interfaces with slider volume control
- Power Fail Transfer switch
- sleek, low-profile design – sits conveniently under the PC monitor
- dual headset or handset ports for fast connection

Features and Benefits

Meridian M2250 Digital Attendant Console

Incoming Call Indicator Keys and Loop Keys allow the attendant to either handle calls in sequence or prioritize answering for specific types of calls. If telephones are not answered, callers can be automatically returned to the console, ending long holding times, cutoffs, and abandoned calls.

Ten Programmable Keys

Support up to 20 additional features, some of which include:

- Auto Dial
- Busy Verification
- Call Park
- Charge Account Code
- Display Source/Destination
- Do-Not-Disturb
- Message Indication/Cancel
- Paging
- Routing Control
- Speed Call
- Stored Number Redial
- Up to 20 Trunk Group Keys with LCD indicators
- Up to 20 Incoming Call Identification Keys with LCD indicators
- six Loop Keys with LCD indicators
- eight Function Keys provide full attendant console functionality
- Built-in 4-line, 40-character display with an optional 2-line display mode enlarges characters for optimal viewing. The backlit LCD is nonglare with contrast adjustment and tilt adjustment and is scrollable to 128 characters (source and destination information). The display provides valuable call information:
 - Time and Date
 - Call source and destination including alphanumeric
 - Call Party Name Display
 - Number of calls waiting

PC Console Interface Unit (PC CIU)

A PC-based attendant console typically consists of two components: the PC Console Interface Unit and PC-based, third-party attendant software application. Most PC-based attendant software applications emulate the functions of the Meridian M2250 Digital Attendant Console providing all of the features and benefits listed above using a Windows-based graphical user interface. In addition to the standard features of the Meridian M2250 Digital Attendant Console, a PC-based application can include:

- feature-rich drag-and-drop and cut-and-paste functionality
- quick access to information screens
- reduced desktop real estate
- projects a professional company image
- online directories with dial-by-name

To enhance the reliability of the PC-based Console, a Meridian Digital Telephone (configured as a Night Service DN) can connect to the interface unit so that if the PC fails, the set can still be used to answer calls. If there is a communication fails between the interface unit and the Meridian 1, the PC application enters Position Busy mode. All calls are directed to another console if one is in service. If not, then calls are directed to a Night DN.

Technical Specifications

Meridian M2250 Digital Attendant Console Dimensions	Length:	24.5 cm (9.6 in.)
	Width:	42.5 cm (16.75 in.)
	Height (front):	2.44 cm (1 in.)
	Height (back):	6.5 cm (2.5 in.)
	Height (with display panel up):	11.5 cm (4.5 in.)
	Weight:	3.15 kg (7 lb)
PC CIU Dimensions	Length:	28.95 cm (11.40 in)
	Width:	33.02 cm (13 in.)
	Height (front):	5.08 cm (2 in.)
	Height (back):	5.08 cm. (2 in.)
	Weight:	2.35 kg (5.2 lb)

Ordering Information

For further information, contact your local Nortel representative.

Nortel Integrated Applications Portfolio

The Nortel Integrated Applications portfolio offers simple, cost-effective solutions to help increase employee productivity and heighten customer satisfaction levels while reducing costs. Geographically dispersed organizations or those that want to control equipment costs can have cost-effective audio conferences and can better manage incoming calls with the Nortel Integrated Applications portfolio for the Nortel Meridian 1, Meridian SL-100, and Nortel Communication Server 1000 systems.

The Nortel Integrated Conference Bridge makes scheduling, administering, and attending a conference effortless for any organization. Nortel Integrated Call Director provides users, who are constantly on the go or away from their desks, with the ability to professionally and discreetly manage their incoming calls by screening and routing calls while ensuring they are accessible to their most important callers. With the Plug and Play capability of Nortel Integrated Recorded Announcer, recorded announcements and music on hold are easy and cost efficient. The Nortel Integrated Call Assistant is a multifeatured automated attendant that routes calls through caller interaction with voice menu prompting. The Nortel Integrated Voice Services is an innovative hospitality solution that enables guests to easily order and confirm their own automatic wake-up and do-not-disturb requests without operator assistance. The Nortel Integrated Digital Enhanced Cordless Telecommunications (DECT) is a wireless in-building or on-campus private network telephony solution that takes advantage of a wide range of benefits to increase your efficiency and to improve your productivity. As a suite or individually, the following Integrated Applications add a rich variety of features and services that remove the hassle and expense from setting up audio conferences and managing incoming calls for organizations with a variety of user needs:

- Nortel Integrated Conference Bridge
- Nortel Integrated Call Director
- Nortel Integrated Recorded Announcer
- Nortel Integrated Call Assistant
- Nortel Integrated Voice Services
- Nortel Integrated DECT (Available in Asia Pacific, Europe, Middle East, Asia, and Greater China only)

Nortel Integrated Conference Bridge

Overview

The Nortel Integrated Conference Bridge (ICB) provides integrated audio conference bridge capability for the Nortel Meridian 1, the Meridian SL-100, and the Communication Server 1000 systems. Organizations that want to extend their communications reach to geographically dispersed customers, clients, or colleagues can do so efficiently and professionally with Nortel Integrated Conference Bridge. Nortel Integrated Conference Bridge provides quick "in-house" access to a conference bridge service, instead of requiring constant coordination with external service bureaus. The Nortel ICB not only enhances an audio conferencing capability with a variety of convenient features and completes Microsoft Outlook integration, but it is an easy to use, self-service administrative tool employees can use themselves to schedule their own conferences.

Ideal For

- any business that wants to use audio conferencing as a means of consolidating communications irrespective of time, date and location
- Microsoft Outlook users who would like to be able to schedule, modify and delete conferences using Outlook as a single step process
- corporate decision makers interested in a high-quality audio conferencing solution. The conference bridge integrates with Nortel Meridian and Nortel Communication Server 1000 systems to reduce costs by not needing additional equipment. The Nortel ICB also joins geographically dispersed organizations using high-quality audio conferencing
- managers who appreciate the cost-savings and efficiency that this intuitive conference administration tool can bring to their organizations

Business Challenges

- Are you looking for an easy to use, cost effective, secure way to conduct audio conferences?
- Are security and reliability important to your business?
- Do you want a product that provides seamless integration, simple installation, and a reduced footprint?

Typical Applications

Any Nortel Meridian 1, Communication Server 1000, or Meridian SL-100 enterprise that wants to bring in-house quality-based digital audio

conference bridge services that is currently outsourced to an external service provider.

Key Points

- Nortel Integrated Conference Bridge delivers cost-effective, reliable, interactive, multipoint audio conferences accessible from any telephone, anytime, anywhere in the world.
- Nortel Integrated Conference Bridge provides administrators and users alike with cost-effective, in-house conference capabilities without the inconvenience of external OEM equipment or expensive, less secure third-party service bureaus.
- The application supports single-purpose audio conferences along with daily, weekly, biweekly, and monthly recurring scheduled conferences with easy in-house access.
- Access to Nortel Integrated Conference Bridge is provided at the user level for conference management and at the administrator level for configuration, editing conference parameters, allocating a bridge, assigning control directory numbers, or analyzing traffic reports.
- You control administration, scheduling, and management of active conferences by a Web-based browser using both the Internet and the intranet on a PC.
- Nortel Integrated Conference Bridge integrates with MS Outlook Calendar to add conference bridge reservations from the Outlook interface.
- Enhanced Call Detail Reports and Billing Options offer intelligent reporting for bill-back capability of conference services. This

includes total number of ports and duration booked and billing for all dialed out calls during the conference.

- Nortel Integrated Conference Bridge supports a telephone user interface (TUI) to allow users to set up a conference from a remote location.
- The Group call-out features enable the chairperson to simultaneously call several people on a predefined list to save time and enhance user productivity.

Features and Benefits

- Nortel Integrated Conference Bridge offers features that make scheduling, administrating, and attending a conference effortless for any organization.
- To ensure conference security, Nortel Integrated Conference Bridge provides password protection on a conference-by-conference basis. You can password-protect specific calls or all calls depending on the level of security you want. The system automatically assigns passwords to conferences or you can set custom passwords when you schedule a conference. Nortel Integrated Conference Bridge allows three attempts to enter a password and if it is still incorrect, the system

advises the user to contact the bridge administrator.

- Flexible conference scheduling and administrative user interface options are available. An intuitive Web-based browser user interface (BUI) makes scheduling and managing active conferences quick and easy. A menu-driven telephone set option lets organizations schedule conferences using any DTMF set, and allows chairperson and conferees to control in-conference features.
- Integration with Microsoft Outlook allows scheduling of meeting and audio ports from a single interface.
- Each Nortel Integrated Conference Bridge card can function independently, providing up to 32 ports (ports equate to concurrent conferees) with support for up to ten simultaneous conferences per card. By linking two Nortel Integrated Conference Bridge cards, 62 ports for a single conference call are available.
- Nortel Integrated Conference Bridge is a global product and supports voice menu prompts for the telephone interface in 15 international languages that can be employed per meeting.

Feature	Benefit
24-hours-a-day, 7-days-a-week availability	Access from any phone, anytime, anywhere.
Acquire chairperson	If the chair leaves the meeting, a participant can become the chair by entering the appropriate passwords.
Spontaneous scheduling	Create single-purpose (nonscheduled) meetings without affecting reserved meetings.
Assign chairperson port	Reserve a port for access by chairperson.
Block-out scheduling	Permit recurring meetings to be established.
Browser user interface	Use an intuitive Web-based interface (BUI) for administration.
BUI administration	Support configuration, schedules, and reports.
Conference extension	Extend meetings beyond allotted time in 15-minute increments.
Copy meeting	Use a browser to copy meeting details to create a similar meeting.
Custom branding	Customize login window, background, with specific designs, and company logo. Nortel Integrated Conference Bridge wizard aids in uploading

Custom greeting	Permit recording of brand line greeting both at system level and for specific conferences.
Dial out	Allow chairperson to call nonparticipants and join them into active conference.
E-mail notification	Send meeting confirmation attributes to the Scheduler
Emergency bridge	Always-on bridge automatically dials a list of predetermined numbers.
Entrance/exit options	Enter or exit by name, tone, or silence.
Group callout	Permit a chairperson to call a preselected group.
Help access menu	Enable a chairperson to play a list of commands.
Lock/unlock conferees	Permit a chairperson to allow or deny participants.
MS Outlook integration	Configure an ICB meeting using Microsoft Outlook.
Meeting extension	Extend a meeting beyond the allotted time in 15-minute increments
Meeting termination	Issue warnings when the meeting is about to end.
Multi-language prompts	Select from 15 supported languages.
Password security	Control access by the chairperson or by participants.
Permanent meeting	Set up a 24-hour-a-day, 7-day-a-week meeting with fixed access number and ports.
Port expansion	Allow additional conferees to join the bridge.
Question and answer mode	In lecture mode, conferees can indicate questions to the speaker using keypad entry.
Roll call	Chair can check participants.
Selective disconnect	Chair can disconnect a participant.
Side bridge	Chair can consult privately with a participant.
Telephone user interface	Menu-driven scheduling and reservation capability.
Voting control	Chair can hold voting sessions with conferees.

Technical Specifications

System Compatibility	Meridian 1 PBX 11C Chassis, 11C Cabinet, 51, 51C, 61, 61C, 71, 81, and 81C; MSL100, CS1000 Series and CS2100
Physical Location	Meridian 1 IPE shelf or a Gateway shelf
Port capacity	32 ports per card; dual-card operation reduces used port capacity to 62 for a dual card conference without chairperson control; chairperson control of dual meeting enables capacity of 60 ports
Conference capacity	Single-card configuration supports up to 10 concurrent conferences where the total does not exceed 32 conferees or a combination thereof; dual-card configuration supports up to 20 conferences concurrently where the total does not exceed 64 participants (32 ports, 2 cards) Unlimited number of scheduled meetings per ICB card
User capacity	Maximum of 500 users, executives, or superusers can register per card; a maximum of 20 users, executives, or superusers can register can concurrently schedule conferences per card
System Interfaces	DS-30X, CE-MUX, Card LAN, RS232, Ethernet adapter
Power Requirements	Supported by module power supply; no external power required; 3.5 W maximum
Simultaneous Conferences	Up to 10 simultaneous conferences per card
Languages Supported	Languages supported for conferees: American English, British English, Brazilian Portuguese, Chinese, French, Japanese, Korean, Latin American Spanish, German, Italian, Dutch, Swedish, Romanian, and Canadian French

Nortel Integrated Call Director

Overview

Nortel Integrated Call Director (ICD) is a versatile, self-service application to intelligently screen and route incoming calls to one or multiple telephony devices based on custom personal profiles, time, and date. Nortel ICD allows users to distribute only one telephone number to their associates, rather than dealing with multiple phone numbers, thereby simplifying the "contact transaction" for their colleagues and customers. With Nortel Integrated Call Director, users can professionally and discreetly manage their call inflow by screening and routing their calls while maintaining continual accessibility to serve their most important callers. ICD also provides flexible features for different stages of a one-number telephone call such as greeting a caller, searching for the called party, or redirecting a call to the user's voice mail. With added functionality ICD can provide remote users (mobile, LAN, or public networks users) with system integration capabilities for call through, call back, conferencing, and call transfer. By dialing a predefined number, remote users can access the ICD card and have it call them back, thereby integrating them into their main switches. For security, users pass by the card by entering a user ID and password or by CLID recognition. After acceptance, users can make calls, transfer calls, or conference call.

Ideal For

- any organization that has mobile workers, mobile sales forces, executives who are campus-based but in all-day meetings, or any employees who are constantly on the go
- individuals with multiple telephones or other devices accessible through the telephony network such as traditional analog and digital phones, IP phones, cellular phones, pagers, fax, or voice mail
- personnel who must maintain contact with colleagues and customers outside of normal business hours

Business Challenges

- Do you want to improve customer satisfaction, increase employee productivity, and enhance customer engagement?
- Do you want your mobile workers to be more accessible?
- Do you want to reduce the typical toll charges incurred by mobile workers?

Typical Applications

Any enterprise with a mobile workforce that needs to be more accessible to customers.

Key Points

- Nortel Integrated Call Director can increase employees productivity levels while simultaneously enhancing customer satisfaction and engagement.

- Integrated Call Director is a single-card slot housed within the IPE and is supported on Nortel Meridian 1 and Nortel Communication Server 1000 systems. Nortel Integrated Call Director provides seamless integration with digital line emulation, thus avoiding possible compatibility issues associated with external equipment. Integrated Call Director builds on the inherent reliability of Nortel Meridian 1 and Nortel Communication Server 1000 call servers.
- Add users and ports as needed by purchasing simple keycode-activated user expansions and upgrades. This upgrade method makes Nortel ICD an attractive enhancement to Nortel Meridian 1 and the Nortel Communication Server 1000 portfolio.
- Each Nortel Integrated Call Director card contains an embedded server that allows users to access the service using the Web to create custom call-screening and routing profiles themselves based on time of day and date scheduling.
- Nortel Integrated Call Director provides two intuitive user interfaces: a Web-based browser user interface (BUI) and a voice-prompted telephone user interface (TUI). The TUI allows users to conveniently change settings from any DTMF telephone.
- The Nortel Integrated Call Director

administrator can benefit from extensive traffic, billing, and event-reporting capabilities with integration into call detail records (CDR). The PCMCIA disk stores traffic measurements one file per day.

Features and Benefits

- Features are easily handled using one of two intuitive interfaces: a BUI or a TUI. The BUI is used to define and set the user characteristics in the follow-me profile, follow-me schedule, temporary overrides, and personal properties (passwords, mailbox number). The TUI is also used to define remote dial profiles for each user. This occurs through the administration BUI for initial setup, or through the user BUI, where call-back number and passwords are set up. The TUI is accessible from any DTMF telephone and permits the user to record up to four personal greetings, assign the greeting to a profile, activate the override capability to change the profile, and program Nortel Integrated Call Director to route calls accordingly. Changing call-back number for remote dialing, making calls, transferring calls, and conferencing through a series of voice prompts occur through the TUI.
- Each card has an IP address to permit both individual subscribers (users) and the administrator access to the various services, such as defining personal routing profiles and call-back numbers from a Web browser. Depending on the setup, a user can access the BUI either through their company intranet or Internet. A TUI is provided for subscribers to initiate immediate overrides to an existing routing profile, or to a direct number if the subscriber is away from their usual place of work and has no Web access. The TUI offers the essential flexibility to remote dial users (mobile, cell, LAN, or public phone) to change their call-back numbers depending on location and to make the feature more cost-effective for their organization.
- ICD supports Nortel Meridian Mail/Nortel Messaging and other voice message systems that have express messaging capability. Nortel Integrated Call Director transfers subscriber's incoming calls to the express messaging number defined in the administrator's BUI. Subscribers can enter a different mailbox number if necessary by using the BUI. An incoming call is automatically transferred to the subscriber's voice mail if the user is unreachable.
- During the Nortel Integrated Call Director search phase for the connection to the user, the calling party can receive a recorded announcement, music while waiting, announcement plus music, or ring back tone. Four options for call disposal are available when the application cannot locate the subscriber: transfer to voice mail, transfer to an administrative assistant, transfer to another number, or disconnect. Remote dial users hear a series of voice prompts in one of 17 different languages to assist with call processing.
- ICD is available in several configurations: 8 ports with 50 users, 16 ports with 100 users, 2 ports with 150 users, and 32 ports with 200 users. The maximum user capacities at each port size are as follows: the 8-port, 50-user configuration can expand to a maximum of 100 users; the 16-port, 100-user card to a maximum of 150 users; the 24-port, 150-user card to a maximum of 200 users, and the 32-port card can grow to a maximum of 300 users.
- The voice menus for users and callers are available in a preferred language with up to 17 languages supported globally.

Feature	Benefit
Intuitive user interface	Accessible by Web-based browser or telephone
Greeting choices	Selectable system, personal or no greeting
Custom profiles	Users control call routing based on their schedule
Call treatment	User defines how and when calls are to be routed
VIP password	Permits special call treatment for the callers
Name request	Announces caller's name for discretionary handling
Calling line request	Announces calling number to the call recipient
Search options	Provides sequential or simultaneous parallel search
Response during search	Provides message, music, message and music or ring back tone to caller
Call answer password	Adds security through user authentication password
Call reconnection	Reconnects call if accidentally disconnected, along with playing voice prompts to inform the caller of the call status
Incoming fax detection	Supports both manual and automatic incoming fax detection
Call disposal	Transfer to voice mail, attendant, or other number
Dial restrictions	Checks validity of dialing parameters set by the user
Override profiles	Users can change their profile from a BUI or TUI for immediate or programmed implementation
Remote dial	Users can change call back number in TUI and BUI user properties

Technical Specifications

System Compatibility	Meridian 1 PBX 11C Chassis, 11C Cabinet, 51, 51C, 61, 61C, 71, 81, and 81C; MSL 100, CS1000 Series and CS2100
Physical Location	Meridian 1 IPE shelf or a Gateway shelf
Port capacity	Flexible to a maximum of 32 ports
User capacity	Maximum of 300 users
Voice Mail Requirements	Third-party voice mail systems must have express messaging capability
Power Requirements	Supported by module power supply; no external power required, 3.5 W maximum

Ordering Information

For further information, contact your local Nortel representative.

Nortel Integrated Recorded Announcer

Overview

Nortel Integrated Recorded Announcer (IRA) is a server-based card that provides high-quality, integrated recorded announcements (RAN), and music-on-hold (MOH) capabilities for Nortel Meridian 1 and Nortel Communication Server 1000 systems. Businesses can increase their customer responsiveness by providing callers with easy 24-hour access to important recorded information. Nortel Integrated Recorded Announcer accommodates a variety of applications with the ability to deliver recorded announcements repeatedly and automatically. Integrated Recorded Announcer can provide general information messages, call-intercept treatment, after-hours business instructions, advertising and promotional announcements, hotel wake-up services, and any other recorded service necessary to optimize the business environment.

Ideal For

- organizations that plan to purchase or connect with existing Nortel Meridian 1 (on X11 Release 19 or later software) and Nortel Communication Server 1000 systems
- any organization that wants to use announcements to keep customers informed or entertained to drive sales and boost customer satisfaction
- organizations that need maximum organizational efficiencies with "routine" calls (for example, hours of operation or locations) handled by the recorded announcer, thus enabling customer-facing personnel to attend to more involved customer calls

Business Challenges

- Do you want a cost-effective way to provide 24-hour easy access to important recorded information, such as your company's business hours and locations, special promotions, schedules of events, advertisements and more?
- Do you want to reduce the costs associated with third-party recorded announcer systems such as additional cabling, separate battery backup, and additional power supply equipment?

Typical Applications

Any enterprise looking for a fully integrated, multifunctioned, digital recorded announcer and music-on-hold service card that improves customer contact without increasing staff or operating costs.

Key Points

- provides integrated RAN and MOH services and built-in trunk ports with universal trunk port emulation, to avoid additional trunk cards or servers and OEM RAN machines

- available in different configurations and offers a comprehensive range of recording and maintenance features for simplified management of recorded announcements
- avoids the need for external OEM equipment and housings to provide recorded announcements and MOH to incoming callers
- integration streamlines the operation and consolidates the installation, maintenance, and support to a single entity; a cost-effective solution that provides a necessary and expected operation to the communication services of the system
- in conjunction with the music broadcast software feature, eliminates the need for dedicated conference cards for MOH, thus offering hardware savings and additional card slots for other use, as well as considerable improvements in real-time capacity and network traffic handling results
- using the telephone user interface (TUI) within the Nortel Integrated Recorded Announcer application, access from any DTMF telephone using password security
- recorded announcements either locally or remotely as often as required

Features and Benefits

- The Nortel Integrated Recorded Announcer delivers a simple, cost-effective alternative to stand-alone digital announcers that traditionally operated as auxiliary adjuncts. The integrated design eliminates the need for external battery backup, power supply, cabling, or switch room space normally required to accommodate third-party stand-alone RAN systems.
- Provides simple plug-and-play installation,

Nortel Integrated Recorded Announcer resides in a single card slot within an IPE module or Voice Media Gateway. Each card is available in a number of configurations tailored to meet the requirements of any business entity. In addition, it delivers a comprehensive range of recording and administration features, on a single platform.

- IRA supports the following applications:
 - first recorded announcement
 - second recorded announcement
 - intercept treatment
 - music on hold and
 - automatic wake-up for the hospitality market.
- Nortel Integrated Recorded Announcer supports both continuous and start and stop modes of playback. Immediate continuous mode recordings constantly play as callers “barge in” on the playback. Delay dial continuous mode initiates a ring-back tone to callers until the recording restarts. Then the incoming caller hears the playback. Start and stop modes reset the recording to the beginning when a call is terminated. All Nortel Integrated Recorded Announcer channels are

fully independent, and it is possible for each channel to play different parts of a recording at the same time.

- Nortel Integrated Recorded Announcer is preconfigured with 24 minutes of storage for announcements and 6 minutes of royalty-free music for the MOH application. Storage for announcements can be expanded up to 5 hours.
- For flexibility, each card can have 1 of 3 port channel (port) configurations: small (2 channels), medium (4 channels), or large (8 channels). If traffic requirements increase, the port capacity of the small and medium cards can be quickly and easily expanded to the high configurations with a software keycode that activates the additional channels.
- To accommodate traffic requirements beyond the 8-channel capacity, up to 16 MIRAN cards can be daisy-chain linked and managed from a single terminal. Nortel Meridian 1 or Nortel CS1000 supports as many cards as required, limited only by the number of IPE or media gateway slots available in the system.

Feature	Benefit
Text-based user interface	Provide menus and commands for all OAM functions
Telephone user interface (TUI)	Access from any DTMF phone for recording or amending announcements
Browser user interface (BUI)	Access through a Web browser to perform OAM functions
Calendar assignments	Schedule announcements based on time of day and month basis using a 366-day calendar
Time and date synchronization	Provide the option to set the parameter manually or synchronize with the Nortel Meridian 1 or Nortel CS1000 system clock
Music-on-hold	Selectively program trunks and routes to provide MOH to callers
Password security	Provide a second-level password on any recording made from a DTMF phone
Announcement recording	Create voice announcements using commercially available sound editor applications
Music recording	Connect to external music sources such as a tape recorder, CD player, or radio
Prerecorded message exchange	Provide in-service recordings immediately with reserve recordings stored in memory
Time of day messages	Assign each channel to play different messages at specific times during the day, week, or month
Multiple modes of operation	Continuous and start and stop modes of playback independent of each channel

Technical Specifications

System Compatibility	Meridian 1 PBX 11C Chassis, 11C Cabinet, 51, 51C, 61, 61C, 71, 81 and 81C; MSL-100, CS1000 Series and CS2100
Physical Location	Meridian 1 IPE shelf or a Gateway shelf
System Interfaces Options	DS-30X, CE-MUX
RAN Storage	Standard 24 minutes – Maximum 5 hours (using PCMCIA)
Port Configurations	2 (small), 4 (medium), 8 (large)
Concurrent Callers	60 (small), 120 (medium), 240 (large)
Administration Interface Options	Browser, Telephony and Text
Speech Compression	G.725 Codec (32 K)
PC Requirements	Windows 95 or later, 100MHz Pentium Processor or greater, 32 MB RAM, 1 GB hard drive minimum, 4x CDROM, speakers; Recommended sound card is Creative Labs AWE 32 Plug and Play Audio Card Model CT3601; Goldwave shareware software recommended for sound editing
Power Requirements	Supported by module power supply; no external power required; 3.5 W maximum

Nortel Integrated Call Assistant

Overview

The Nortel Integrated Call Assistant is an IPE card that provides autoattendant functionality for Nortel Meridian 1, Meridian SL-100 and Communication Server 1000 systems. It is compatible with all Meridian 1 PBX options that support IPE. With Integrated Call Assistant, a voice-response user interface greets a caller. Custom voice-response user-interface settings create an application that meets individual customer requirements, from basic to complex. Incoming fax calls can be routed to a predefined fax number.

Ideal For

- The Integrated Call Assistant is an ideal solution for Meridian customers who want to make the most effective use of resources and improve customer satisfaction by offering 24-hour information service.
- ICA is for customers who choose not to purchase Nortel Messaging and find third-party voice mail systems less convenient than an integrated solution.

Business Challenges

Any Meridian customer that wants an integrated solution that is both cost-effective and provides full feature, high-quality autoattendant functionality.

Typical Applications

- Auto Attendant with voice menus: basic, menu-driven call handling that can be used for help desk applications or DTMF name and number dialing. Call handling can be CLID and time-sensitive or ☐ dependent. The Integrated Call Assistant determines if a call is an incoming fax or a voice call and route the calls accordingly.
- ACD front-end call handler: play greetings and route calls through menu based prompts, by CLID and/or DNIS.

Key Points

- increases customer service and staff productivity by routing calls even when an operator is not present or available
- provides callers with easy 24-hour access to automated self-service menus, which speeds call processing by routing customers to vital decision-making information
- automatically routes callers to the services they want, allowing employees to focus on

high-level customer service and support issues. The improved efficiency combined with better customer communications translates into large time and cost savings

- employee productivity is improved by removing them from time-consuming routine inquiries and call-routing functions that the Integrated Call Assistant can handle
- the Nortel Integrated Call Assistant can be a call center front-end single number for fax with menus leading to sales, service, and emergency routing

Features and Benefits

- integrated solution that is easy to install and maintain
- easy to configure and administer from many locations including Web browser GUI and telephone DTMF—either on-site or remotely
- automated solution for 24-hour access to menus that route customers to vital information and resources
- one number for phone and fax for increased customer convenience and cost reduction by eliminating separate fax lines
- flexible low-cost autoattendant or ACD front-end call handler allowing customers to define their own applications as well as voice menu prompts, greetings, and menus changed externally for emergency situations
- call routing functionality that provides incoming callers with recorded messages and then routes them based on Calling Line ID or Dialed Number Identification (DNIS), or both
- uses a 366-day calendar to program and play messages and other menu choices on the time, day, and date specified
- supports up to eight languages

Technical Specifications

	PCMCIA Flash Card	PCMCIA Disk
Voice greetings (use in front of voice menus)	16 (Maximum 10 seconds each)	32 (Maximum 10 seconds each in 8 languages)
Voice menus	16 (Maximum 60 seconds each)	32 (Maximum 60 seconds each in 8 languages)
Language capacity	One	Eight (American English, British English, French, Latin American Spanish, Brazilian Portuguese, Chinese, Japanese, and Korean)
Database name capacity	1000	10 000
Personal verification recordings	Not available	3000 subscribers (up to 3 seconds in length)
Administration interface options	Browser, Telephony and Text	
Power requirements	Supported by module power supply; no external power required; 3.5 W maximum	

Nortel Integrated Voice Services

Overview

Nortel Integrated Voice Services (IVS) is an innovative hospitality solution for Nortel Meridian 1 and Nortel Communication Server 1000 systems that enhances guest Automatic Wake-Up (AWU) and Do-Not-Disturb (DND) services by integrating them into the Nortel Meridian 1 PBX. IVS enables guests to easily order and confirm their own automatic wake-up and do-not-disturb requests without operator assistance, thus providing maximum guest satisfaction and freeing the operator to attend to other guests' needs. Integrated Voice Services enable the guest to access a voice-prompted service menu directly from the room. The guest is greeted with simple prompts in the guest's language and is instructed how to order an Automatic Wake-Up or Do Not Disturb call.

Ideal For

Small properties that use a Meridian 1 PBX and are looking for improved guest services.

Typical Applications

The Integrated Voice Services application is for hotels or hospitals that want to give guests or patients the ability to activate Automatic Wake-up and Do Not Disturb features from their telephone set.

Key Points

- IVS integrates with the Property Management System (PMS) using the Meridian 1 PBX.
- The operator can assist the guest with AWU or DND from the operator console, if desired. The hotel property can have a great deal of flexibility in offering AWU and DND services to guests.

Features and Benefits

- At check in, the guest language preference is set by the PMS, is echoed by the Meridian 1

PBX, and read by the Integrated Voice Services Card.

- Upon receipt of a request for a wake-up, the PMS sets up the request in the Meridian 1 PBX. The Meridian 1 PBX then handles all wake-up functionality in the same manner as it is currently executed.
- Guests can set the AWU or DND feature themselves, which can significantly reduce the time an operator spends assisting with AWU and DND data entry.
- IVS contains a voice menu from which the user can select the desired service.
- Guests can add, modify, or delete an automatic wake-up request.
- Guests are given confirmation of time requested for wake-up.
- Staff can order Automatic Wake-up and Do Not Disturb on behalf of a guest; this service is password-protected.

Technical Specifications

System Compatibility	Meridian 1 PBX 11C Chassis, 11C Cabinet, 51, 51C, 61, 61C, 71, 81, and 81C; MSL-100, CS1000 Series and CS2100
Physical Location	Meridian 1 IPE shelf or a Gateway shelf
System Interfaces Options	DS-30X, CE-MUX, card LAN
Port Configurations	2 (small), 4 (medium), 8 (large)
Number of Rooms Supported	200 (small), 500 (medium), 1000 (large)
Administration Interface Options	Browser, Telephony and CLI
Power Requirements	Supported by module power supply; no external power required

Nortel Meridian 1/Nortel Communication Server 1000 Integrated DECT



Overview

Nortel Meridian 1/Nortel Communication Server 1000 Integrated Digital Enhanced Cordless Telecommunications (DECT) is a wireless, in-building and on-campus, private network-wide communications system. The DECT is an integrated offering on the Nortel Meridian 1 or Nortel Communication Server 1000 system giving full feature access, high capacity, and good spectrum use along with superior voice quality. The Integrated DECT product operates on any release of X11 software from Release 23 with existing shelf components and backplanes.

The DECT architecture is flexible in terms of the total number of users and the concentration of users. The main component of the DECT system is the DECT mobility card (DMC), which provides the interconnection between the Nortel Meridian 1/Nortel Communication Server 1000 switching features and the wireless system. Other components of the DECT system are radio fixed parts (RFP) base stations, wireless handsets, and the Nortel Optivity Telephony Manager DECT application, plus an optional text messaging application.

Ideal For

- individuals who spend time away from their desks
- individuals without dedicated office space
- individuals with multiple work areas
- businesses in industries such as manufacturing, retail, professional services, education, hospitality, and health care (GSM can be inappropriate near sensitive medical equipment)

Key Points

- **Lightweight and Pocket-sized:** A DECT handset is the mobile equivalent of a desk phone.
- **Improves Productivity:** With a Nortel Integrated DECT solution, essential staff are always reachable, so urgent, on-the-spot decisions ensure minimum delay and improve internal communications. Employees can manage their day effectively. With few missed calls, the response time from your customer service and sales teams improves, to provide high customer satisfaction.
- **Reduces Costs:** You see marked changes in business productivity, and you save money. Your phone bills are low because you need not return as many calls; internal calls are free and external calls made from your Nortel DECT handset cost the same as those made from

your desktop-wired phone.

- **Integrated and Scalable:** A Nortel Integrated DECT solution provides high reliability, rich features, and easy management because it is a fully integrated solution. As your company grows and your needs change, you can expand the system to include any additional requirements to make the system easy to tailor to your specific company needs.
- **Superior Speech Quality:** A Nortel Integrated DECT solution uses 32 kb/s Adaptive Differential Pulse Code Modulation (ADPCM) speech-encoding technique, which ensures that the DECT cordless phone delivers excellent speech performance to the same standard as you expect from a traditional wired telephone.
- **Secure:** DECT technology ensures maximum call security. The digitally encoded signal is encrypted and hence cannot be monitored by external intruders, guaranteeing total privacy for sensitive conversations.
- **Flexible:** The DECT solution builds on existing Nortel Meridian 1 or Nortel Communication Server 1000 platforms and complements circuit-switched and IP telephony.

Features and Benefits

The DECT system uses 32 Kb/s ADPCM to offer the same speech quality as fixed networks. The DECT solution provides a wide range of features:

- **Hand-over:** You can walk and talk; your conversation is transferred automatically between strategically located base stations.
- **Twinning:** You can easily swap from your DECT handset to your desk phone and continue your conversation with a single phone number for both sets. Alternatively, the system can allow privacy between the two sets, either on the same or on different phone numbers.
- **Network Roaming:** You can move from one site to another within the entire campus or private network with the same handset and telephone number.
- **Full roaming:** DECT offers seamless hand-over.
- **Uniform Numbering plan:** Your DECT handset number can be the same as or different from your desk number, but the number is always part of the company numbering plan.
- **Pull-through Features:** You can access the same feature as on your desk phone such as Calling Line ID, Calling Party Name Display, Conference, Call Transfer, Call Hold, Call Back, Call Pick-up, Call Park/Retrieve
- **Text Messaging:** You can send and receive text messages from or to your DECT handset.
- **Coverage:** The DECT system functions up to one million square meters per system (depending upon building characteristics).
- **Low Power Output:** DECT technology uses several advanced digital radio techniques to achieve efficient use of the radio spectrum with low risk of radio interference with sensitive equipment.
- **Wireless Encryption:** The digitally encoded signal cannot be monitored by external intruders, for maximum privacy.
- **Scalable:** This solution is scalable across Nortel Meridian 1 Option 11C chassis and cabinet, Option 61C, Option 81C, Communication Server 1000M and Communication Server 1000S and Communication Server 1000E.
- **Fully Integrated Solution:** DECT cards are in the IPE module of Meridian 1 and Communication Server 1000M and in the media gateway of Communication Server 1000S, while in the Communication Server 1000E the Integrated DECT solution is supported in the Media Gateway 1000T.
- **Nortel DECT Messenger:** The messenger function allows alarms and preconfigured text messages to be sent to a DECT handset from a wide variety of input sources, such as hard contacts, a serial input from an alarm system, or an ESPA paging controller.

System capacity (based on DMC8)	•Nortel Communication Server 1000 X21 Release 1 – Up to 640 handsets and 32 base stations •Nortel Communication Server 1000M Release 3 and Nortel Communication Server 1000M Release 4 – Same as Nortel Meridian 1 Option 61C and Option 81C • Nortel Communication Server 1000E Release 4 – Up to 1000 handsets and 56 base stations •Nortel Meridian 1 Option 11C-Chassis X11 R23 and later – Up to 640 handsets and 32 base stations •Nortel Meridian 1 Option 11C- Cabinet X11 R23 and later – Up to 640 handsets and 160 base stations •Nortel Meridian 1 Option 61C and Option 81C X11 R23 and later – Approximately 3000 handsets (based on typical office traffic levels) and 256 base stations
DECT base station	•Two base station options •6 simultaneous standard calls •12 simultaneous high capacity calls •Typical cell radius within a building 20–100 m (65.62 ft x 328.1 ft) •Optional directional antenna • Small physical size: Height: 23.5 cm (9.4 in.), Width: 17.2 cm (6.9 in.), Depth: 4.5 cm (1.8 in.)

Market Information

The Nortel Integrated Applications portfolio of integrated Web-accessible applications for Nortel Meridian 1 and Communication Server 1000 systems delivers flexible, scalable solutions to fit your business needs. As a suite or individually, Integrated Applications add a rich variety of features and services and deliver tangible and measurable cost reductions versus external service bureaus and third-party solutions providers.

Technical Specifications

	4025  4025 DECT Handset	4060  4060 DECT Handset	4145 EX  4145 EX DECT Handset	DECT Industrial  DECT Industrial Handset
Display	Large Display • 3-line alphanumeric display • 1 icon line plus 2 text lines	• 5-line, 16-character alphanumeric display for icons, text- and context-sensitive soft keys	• Large Graphic Display • 4-line alphanumeric display • 3 text lines and 1 icon line display backlight	• 3-line, 12-character alphanumeric display for icons, text- and context-sensitive soft keys
Features	• visual voice mail and fax message waiting indication on handset with Nortel CallPilot • Built-in visual alerts for incoming calls • Calling line ID and Calling Party Name Display • 50-name and number directory, including search facility • Predial and number edit capability • Last 10-number redial and caller list including dial-back feature • Electro-luminescent backlight • High-quality handsfree functionality • Microphone mute for privacy and reduced ambient noise • Keypad locks for security	• visual voice mail and fax message waiting with Nortel CallPilot • Built-in visual and vibrate alerts for incoming calls • Calling line ID and Calling Party Name Display • 100-name and number directory, including search facility • Support for DECT messaging with text and alarms • Predial and number edit capability • Last-20-number redial and caller list including dial-back feature • Electro-luminescent backlight • High-quality full-duplex handsfree • Microphone mute for privacy and reduced ambient noise • Keypad locks for security • Compatibility with Microsoft Windows for desktop dialing	• visual voice mail and fax message waiting indication on handset with Nortel CallPilot • Built-in visual alerts for incoming calls • Calling line ID and Calling Party Name Display • 80-name and number directory, including search facility • Supports Text Messaging • Support for DECT messaging with text and alarms • Urgent Melodies (19) for urgent messages • Predial and number edit capability • Last-10-number redial and caller list including dial-back feature • SOS Key • Microphone mute for privacy and reduced ambient noise • Keypad locks for security	• voice mail message waiting • 80 name directory • Incoming Call Log for 10 unanswered calls • Calling line ID • 10 entry last number redial list • Vibration alert • Microphone mute • On hook and off hook dialing • Last-10-number redial and caller list including dial-back feature • Microphone mute • Automatic encryption

	4025	4060	4145 EX	DECT Industrial
Battery Life	Extended battery life – 20-hours operational; 200-hours standby	Extended battery life – 15-hours operational; 200-hours standby	Extended battery life: 15-hours operational; 150-hours standby	10 hours talk time; 100 hours standby
Languages	Spanish, French, English, Italian, Dutch, Swedish, Danish, Norwegian, Finnish, Portuguese, and German	Spanish, French, English, Italian, Dutch, Swedish, Danish, Norwegian, Finnish, Portuguese, and German	English, French, German, Italian, Spanish, Portuguese, Dutch, Swedish, and Danish	English, French, German, Italian, Spanish, and Dutch
Optional Accessories				
Belt clip	X	X	X	X
Easy clip	X	X	-	-
Safety clip	-	-	X	X
Carrying case	X	X	X	
Headset	-	X		X
Desktop charger	X	X	X	-
Charger rack	X	X	-	-
Technical Details				
	4025	4060	4145 EX	DECT Industrial
Additional Features	-	-	• ATEX approved for Europe • IEC approval for other regions • Water and dust resistant to IP54	-
Complies with	ETU; E.161, ETS300 329, ETS300 400, CTR 6, CTR 10, CTR 22 (DECT GAP compatible)	ETU; E.161, ETS300 329, ETS300 400, CTR 6, CTR 10, CTR 22 (DECT GAP compatible)	EN; 50014, EN 50020, EN 50281-1-1, EN 60529, IEC 60079-0 & IEC 60079-11	-
Battery:	3 x standard AAA 850 (typ. 800) mAh NiMH battery	700 mAh NiMH battery	Use battery type N0024967 only	-
Operating frequency:	1880 – 1990 MHz 250 m W max transmitter output power	1880 – 1990 MHz 250 m W max transmitter output power	1880 – 1990 MHz	-

Operating temperature:	0° C to 45° C (32°F to 113°F)	0° C to 45° C (32°F to 113°F)	0° C to 40°C (32°F to 104°F)	Relative Humidity at 40°C (104°F) Storage: -30°C to +60°C (-22°F to 140°F) – up to 95% operation -10° to +55°C (14°F to 131°F) – up to 90%
Dimensions	Height: 14.6 cm (5.7 in.) Width: 5.3 cm (2.1 in.) Depth: 2.8 cm (1.1 in.)	Height: 14.3 cm (5.6 in.) Width: 5.1 cm (2 in.) Depth: 2.6 cm (1 in.)	Height: 14.8 cm (5.8 in.) Width: 5.0 cm (2 in.) Depth: 2.8 cm (1.1 in.)	Handset: Height: 14.5 cm (5.7 in.) Width: 5.2 cm (2 in.) Depth: 2.7 cm (1.1 in.) Charger: Height: 5.3 cm (2.1 in.) Width: 7.1 cm (2.8 in.) Depth: .8 cm (0.3 in.) Handset volume: 203 cc
Weight	140 g (4.9 oz)	140 g (4.9 oz)	130 g (4.55 oz) incl. battery ± 10 g (.35 oz)	(including batteries) Handset: 140 g (4.9 oz) Charger: 370 g (12.95 oz)
Systems Supported	Compatible with Nortel Communication Server 1000 and Meridian 1 PBX	Compatible with Nortel Communication Server 1000 and Meridian 1 PBX	Compatible with Nortel Communication Server 1000 and Meridian 1 PBX and BCM	Compatible with Nortel Communication Server 1000 and Meridian 1 PBX

Ordering Information

For further information, contact your local Nortel representative.

Nortel Wireless LANs

Nortel Wireless Local Area Network (WLAN) solutions enable enterprises and service providers to offer 802.11 wireless connectivity at anytime and from anywhere. The Nortel WLAN 2300 series represents the latest WLAN infrastructure technology and provides a cost-effective, flexible solution that delivers the performance, the management tools, and the resiliency required to deliver high-quality voice and multimedia applications over a wireless network. The WLAN 2300 series complements the WLAN 2202 Mobile Adapter and WLAN IP Telephony products to provide a turnkey voice-over WLAN solution. The Nortel Wireless Mesh Network solution extends WLAN to the outdoors and other open spaces while providing cost efficiencies and expedited deployment using wireless backhaul technology.

- Nortel WLAN 2300 series
 - Nortel WLAN Security Switch (2350)
 - Nortel WLAN Security Switch (2360, 2361)
 - Nortel WLAN Security Switch (2380)
 - Nortel WLAN Access Point 2330/A
 - Nortel WLAN Management Software 2300
- Nortel WLAN Mobile Adapter 2202
- Nortel WLAN IP Telephony Manager 2245
- Nortel WLAN Application Gateway 2246
- Nortel Wireless Mesh Networks
 - Nortel Wireless Access Point 7220
 - Nortel Wireless Gateway 7250
 - Wireless Bridge 7230

Nortel Wireless Local Area Network 2300 Series



Overview

The Nortel Wireless Local Area Network (WLAN) 2300 series is a complete 802.11 solution for enterprises that want to deploy widespread wireless coverage for today's business, IP Telephony, and converged multimedia applications. The solution combines the latest industry standards with a centralized architecture and advanced features to create a secure, cost-effective, scalable WLAN infrastructure. The WLAN 2300 series includes the tools and features required for successful planning and implementation, whether deploying a first-time WLAN using a quick and simple approach or graduating to a precisely engineered mobile infrastructure as part of a global enterprise mobility strategy. The three primary elements in the series include a multimode access point (AP), a portfolio of WLAN Security Switches, and a WLAN Management Software system. Each element plays an essential role in the complete mobility solution.

- The Nortel WLAN 2300 family of security switches controls the access points and performs key functions such as security, networking, quality of service (QoS), and roaming for mobile users. The WLAN Security Switch also correlates radio frequency data from multiple access points and coordinates the response to changing RF conditions and RF attacks.
- The Nortel WLAN Access Point 2330 performs 802.11a/b/g mobile connectivity, encryption and decryption for wireless traffic, priority queuing and radio frequency (RF) monitoring, including rogue access point identification and containment. Access points exchange control and data traffic with the associated WLAN Security Switch.
- The Nortel WLAN Management Software system is a comprehensive design and management tool that identifies ideal access point locations on detailed floor plans, configures all devices with a single click, and provides granular monitoring and reporting for complete visibility and control over the entire system.

Nortel WLAN Security Switch 2300 series

The WLAN Security Switch 2300 series includes four security switches. Each switch meets the specific needs of enterprise-wide deployments. The portfolio, combined with advanced features and a common management system, provides unparalleled deployment flexibility and scalability to meet the growing demands of mobile professionals. Businesses can deploy and manage each switch independently or participate with other 2300 Security Switches in large enterprise network deployments. In multiple switch architectures, switches share client information and policies to permit fast roaming among all access points. Regardless of network size or topology, the WLAN Security Switch 2300 family can lower equipment costs substantially by offering the suitable product for any deployment scenario.

Nortel WLAN Security Switch 2350

The WLAN Security Switch 2350 is the smallest switch in the 2300 series. The 2350 is suited for extending WLAN services to small or branch office environments. The WLAN Security Switch 2350 autoconfigures when it first connects to the network and can control up to three access points. The 2350 offers the same features as the larger 2300 switches but in a smaller package.



Nortel WLAN Security Switches 2360 and 2361

The WLAN Security Switches 2360 and 2361 are ideally suited for mid-size office sites or wiring closet deployments and can control as many as 12 access points that can connect directly to one of the eight Ethernet ports or indirectly through a Layer 2 or 3 of the network. A dual-power option provides improved resiliency for converged services.



Nortel WLAN Security Switch 2380

The WLAN Security Switch 2380 is the largest switch in the 2300 series. Nortel designed the 2380 for large deployments and data center applications in enterprise and carrier environments. The 2380 licensing controls up to 120 access points, which are distributed across a network Layer 2 or 3 and connected through one of the four Gigabit Ethernet ports. Dual, hot-swappable power supplies provide superior resiliency for voice services.



Nortel WLAN Access Point 2330/A

The WLAN Access Point 2330/A is a multimode 802.11a/b/g device that is controlled by the WLAN 2300 Security Switches and provides multimode 802.11 a/b/g service to mobility clients. Nortel designed the Access Point 2330 /A for dense deployments and to deliver high-performance mobile connectivity without sacrificing security or manageability. The Access Point 2330/A is plenum-rated for ceiling installations and features an attractive enclosure that resembles a common smoke detector to blend in with office environments. A portfolio of external antennas is available to facilitate coverage in unique environments.



Nortel WLAN Management Software System

After deploying the WLAN 2300 system, the Administrator uses WLAN Management Software system for all the ongoing management and optimization. The tool coordinates RF sweeps to detect and locate rogues, with WLAN Management Software system displaying the newly discovered devices on the floor plan. The Administrator also uses WLAN Management Software system for user management. The tool locates users on the floor plan and displays the user's network use statistics, roaming history, and addressing details that summarize the Identity-Based Networking services that the system provides.

The WLAN Management Software system provides the traditional management functions, detailing system-level events and statistics for the wired network, the air (RF), and users. WLAN Management Software RF topology-mapping and coverage-verification tools simplify ongoing optimization, making it easy to adjust coverage areas or add new ones.

Ideal For

The Nortel WLAN Security Switches are ideal for the following:

- enterprises wanting widespread wireless coverage for today's business IP Telephony and converged multimedia applications
- progressive small and medium-size businesses in industries such as technology, finance, consulting, legal, or others that lead the adoption of mobile technology and that need the security of a high-end WLAN solution
- mid-size enterprises to large global corporations that want to implement a WLAN corporate standard across all offices
- IP Telephony Convergence customers that require a high performance, resilient WLAN to support their applications

Business Challenges

The business challenges to consider when deciding to purchase a Nortel Security Switch are:

- Do you want to provide convenient and secure wireless access to all of your network applications and services?
- Do you want to improve productivity by empowering employees with today's low-cost Wi-Fi devices?
- Do you want to improve office collaboration and productivity through anywhere-mobile access to resources?
- Do you want to simplify moves, additions, and changes within the office using wireless technology?

Typical Applications

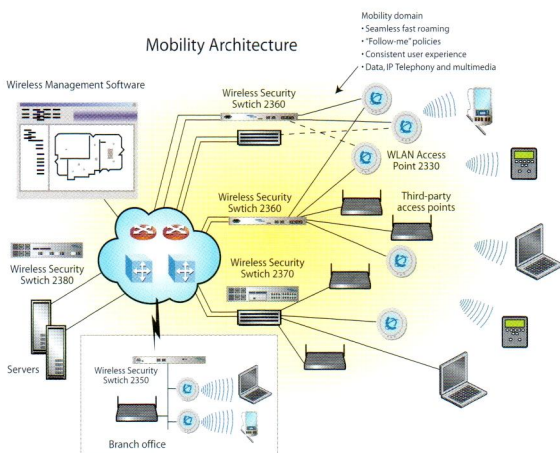
Examples of typical applications of the Nortel Security Switches are as follows:

- corporate-wide WLAN installations in medium to large enterprises
- transportation hubs such as airports, shipping yards, train stations, and bus terminals that recognize the ability of the WLAN 2300 series to run concurrent virtual service groups from a

single WLAN infrastructure

- multitenant units and service providers that offer a managed service in public areas for using virtual service groups with captive portals to resell internet connectivity
- certain vertical markets that are active in WLAN: health care, education, finance, logistics, and government segments have unique business problems solved by WLANs

Network Diagram



Key Points

Built to support Voice and Multimedia applications in today's networks

- Adheres to the latest QoS standards including SVP and WMM.
- Reduces the performance impact of 802.1x by offloading back-end AAA servers of key generation and management.
- Offers fast, secure roaming between all APs with the minimal latency and jitter needed to support time-sensitive applications.
- Supports dynamic RF management for service resiliency by protecting against unexpected interference, obstacles, outages, and weak

coverage zones.

- Provides full n+1 redundancy of all network components to protect against service interruption.

Flexible policy management keeps control over roaming users

- Supports a user-based policy management option to bind individual users with centrally defined AAA policies.
- Applies security and QoS policies to follow users as they roam anywhere on the WLAN network.
- Enforces access controls, VLAN assignments,

subnet assignments, bandwidth rate, QoS priorities, and multicast memberships even if the user roams between floors and buildings.

- Supports the ability for administrators to assign time-of-day and location-based restrictions that block access from specific areas like parking lots, examination rooms, or emergency rooms.

Easy implementation—from planning to production

- Provides a WLAN Management system to help network administrators during every phase of a WLAN project from planning and configuration through to monitoring, reporting, growth, and continuing operations.
- Provides a visual map of the ideal WLAN network including radio coverage, physical topology, and AP locations.
- Adjusts mappings for RF obstacles such as walls, pillars, windows, and office partitions.
- Produces a customized bill of materials for baseline implementation or hypothetical scenarios.
- Supports switch and access point configurations for pushing out to all system elements with one keystroke.
- Supports granular monitoring and custom reporting to keep administrators on the current activity for troubleshooting and support.

Seamless deployment in any network

- Operates as an overlay to existing IP networks without the need for network reconfigurations or expensive upgrades to core switch infrastructure.
- Supports configuration to enforce existing RADIUS authentication policies and

extensions.

- Uses standard protocols that do not affect other devices.
- Supports installed access points on any subnet or in any wiring closet, so the placement can be simple, convenient, and focused on providing optimal wireless coverage.
- Supports access points attached to their controllers across the network and self-configured.
- Supports the capability for one WLAN infrastructure to be partitioned securely to form up to 32 unique service groups, each with its own Web-portal, security, and QoS policies.

Standards-based, Open Client approach for user and application compatibility

- Adheres to the latest IEEE and industry standards to help ensure strong security and QoS while maintaining compatibility with user devices.
- Supports security standards such as WPA, WPA2, 802.11i/802.1x with WEP, Dynamic WEP, TKIP, CCMP, EAP-TLS, TTLS and PEAP, and PEAP-TLS.
- Supports QoS standards including 802.1p and DiffServ, WMM, and SVP.
- Offers advanced features compatible with all 802.11 clients such as dynamic RF management, roaming, and user policy management.
- Supports WLAN Management software for easy planning by recognizing floor maps in all common formats including AutoCAD DXF, AutoCAD DWG, JPEG, or GIF file types.

Features and Benefits

Feature Description	Benefit
Switched WLAN Architecture ("thin" AP model) • Switch transfers AP of networking, roaming and security functions • Device management is centralized • WLAN 2300 features a unique traffic flow architecture	• System approach forms the foundation for new capabilities such as RF management, inter-subnet roaming and location • Thin APs are less expensive than stand-alone APs • APs can autoconfigure for easy implementation
Standards-based security and QoS • 802.11 a/b/g • 802.11i, WPA/WPA2 • SVP - WMM (certification pending)	• Strong security and QoS capability while maintaining client interoperability
RF Management • Switch receives RF data from scanning APs • Switch/WMS identifies interference, coverage outages, 802.11 devices • Switch dynamically adjusts AP channel and power	• Self-optimization • Self-healing • Base technology for Rogue AP detection and 802.11 device location
Wireless Threat Protection • Guards against layer 2 radio vulnerabilities like DoS, flood, jamming attacks, • Alerts administrators of attack and locates	• Complements 802.11i for improved service resiliency
Rogue AP Protection • Identifies unauthorized AP and maps location on floor plan • Launches containment measures from neighboring APs	• Complements 802.11i for improved service resiliency
User load balancing • Sends new users to alternative APs based on capacity use	• Improved performance and user experience for all clients
Fast Roaming • Special handling of encryption keys and authentication processing to avoid redundant authentication while roaming	• Minimizes latency and jitter when roaming • Delivers improved IP Telephony
Location Services • Locates and tracks active 802.11 devices	• Location-based authentication • Asset tracking • Site security
Resilient Design: • Dual Ethernet ports on Access Point 2330 • Redundant hot-swappable power supplies on switches • N+1 redundant architecture	• Improved reliability of WLAN service • Improved user up-take and service stickiness • Allows service providers to differentiate on SLA
Symmetrical traffic flow • Tunnels each user's session back to originating switch while roaming	• All applications continue to work when roaming • Multicast • "Push-to-talk" • IP, IPX, AppleTalk, and others • Scalable - remains simple in large multiswitch deployments • Simplifies management and troubleshooting • Permits use of stateful firewalls in the flow – asymmetric flow can break firewalls

Broad Wireless Security Switch portfolio: • Each designed for a common deployment scenario • Common software, features and management	• No need to buy more product than needed • A corporate standard is implemented across all regions and offices
Wireless Security Switch 2350 Branch Office Switch • A small switch is deployed onsite to manage a few branch office APs • Fundamentally a different approach from deploying a "remote" thin AP	• Switch is local instead of elsewhere on the network across a WAN connection • WLAN works if WAN link fails • No firewall or VPN reconfigurations are required to support "thin" AP control protocols over WAN link • Fast switch responses translate into improved performance. Fast authentication and roaming
Flexible policy management • By user, group, SSID, device, location, time-of-day, day-of-week • Security Policies – VLAN, L3/4 filters, roaming restrictions • QoS Policies – bandwidth, priority queuing • AAA Policies – server, backup, grouping or local	• Solution fits with existing policy architecture • Identity-based networking (user-based policies), centralizes policies on backend AAA servers for easy management and scalability • Block access from parking lot, but not foyer • Restrict WLAN service to secured areas only after 5:00 p.m.
Site Planning tool with WLAN Management Software 2300 • Imports existing floor plans including common AutoCAD files • Calculates required number of APs and switches and configurations • Identifies ideal AP locations on floor plan • Creates a bill of materials • Based on capacity and throughput requirements	• Takes the guesswork out of AP placement and configuration • Quick time-to-service • Mitigate the need for a costly site survey
Ekahau Site Survey tool integration • WMS 2300 can import site survey information	• Provide an accurate RF map based on site survey results • Accurate planning and location services
Virtual Service Groups • Up to 32 per radio (64 per AP) • Each has unique SSID, VLAN, Subnet, AAA and policies. • Each can have a unique and customizable authentication web portal (captive portal).	• Share one WLAN infrastructure among multiple user groups • Owners of public infrastructure can resell wireless connectivity to service providers • A provider-based virtual service group can offer Internet Telephony from enterprise WLAN
• Controls third-party Access Points from Cisco and 3Com • Most features excluding RF management • Authentication, user policy enforcement and intersubnet roaming • Cisco Aironet 350, 1100, 1200	• Fast time-to-service • Low cost • Smooth transition
Scanning with external antennas • Allows RF scanning to be performed with external antennas	• More accurate site planning through more accurate RF mapping • More accurate user location and rogue AP detection
802.1x/EAP Offload • The switch terminates and processes 90% of the EAP tasks • Offloads these implementations: EAP-TLS, PEAP and EAP-MD5	• Decreases load on back-end RADIUS servers • Support WLAN implementation with 802.1x without RADIUS modifications • Perform local 802.1x without relying on WAN link
Guest Access Provisioning • A streamlined "front-desk" application for provisioning a temporary guest ID • Each ID can have access restrictions and time expirations	• Receptionist with no technical training can offer WLAN service • Controlled guest access provides greater security than "Guest" SSID • Give guests access to more than the internet • Time expiration prevents lingering open accounts

Market Information

According to Dell'Oro Group, the worldwide WLAN market opportunity will exceed \$3.5 billion in 2007, with centralized WLAN architectures outselling legacy stand-alone access point solutions. This trend reflects a recent shift in customer preferences from distributed WLAN architectures that can be difficult to deploy, secure and manage to centralized solutions like the WLAN 2300 series that combine a wireless switch with controlled access points. The WLAN 2300 is different from its competitors in the ability to handle voice and multimedia traffic, to provide a high-level of scalability, and to rigorously control users and security.

Technical Specifications

	Nortel WLAN Security Switch 2350	Nortel WLAN Security Switch 2360/2361	Nortel WLAN Security Switch 2380
Number of Fast Ethernet ports/Power over Ethernet	2/1	8/6	0/0
Number of Gigabit Ethernet ports	—	—	4 GBIC/ 1000 Base-T
Number of Access Points Supported	3	12	Licensed 40/80/120
Third Party AP Support	Yes	Yes	Yes
Form Factor	Small	1 RU mount	2 RU mount
Power Supply	Single	Single (2360) Dual (2361)	Dual-redundant Hot-swappable
Application	SMB/branch office	Mid-size office/Wiring Closet	Data Center
Dimensions Height: Width: Depth:	14.6 cm (5.75 in.) 3.2 cm (1.25 in.) 19 cm (7.5 in.)	25.6 cm (10.08 in.) 4.4 cm (1.72 in.) 44.2 cm (17.4 in.)	8.8 cm (3.5 in.) 44.2 cm (17.4 in.) 46.2 cm (18.2 in.)
Weight	0.7 kg (1.5 lb)	3.8 kg (8.5 lb) with one power supply 4.3 kg (9.5 lb) with two power supplies	9.79 kg (21.75 lb) with one power supply 11.25 kg (25 lb) with two power supplies
Power	External Power Supply: Input: 100-150 V ac, 47-63 Hz, autosensing Output: 48 V dc, 0.75A Amperage draw maximums: At 115 V (RMS): 0.8A At 230 V (RMS): 0.4A	Power V ac range, Hz range: 90-132 V ac/180-264 V ac, 50-60 Hz, autosensing Amperage draw maximums: 115 Vrms: 4 Arms At 230 Vrms: 2 Arms	Power V ac range, Hz range: 90-250 V ac, 47-63 Hz to 350 watts, hot-swappable power supply Amperage draw maximums: At 120 Vrms: 8 Arms At 230 Vrms: 3.5 Arms

Operating Temperature	—10°C to 50°C (14°F to 122°F)	—10°C to 50°C (14°F to 122°F)	—10°C to 50°C (14°F to 122°F)
Storage Temperature	—20°C to 70°C (—4°F to 158°F)	—20°C to 70°C (—4°F to 158°F)	—20°C to 70°C (—4°F to +158°F)

	Nortel Access Point 2330/A
Radio Support	802.11 a/b/g
Power over Ethernet (802.3af)	Yes
External antennas	Yes (high-gain directional antennas)
Dimensions	Diameter: 16.76 cm (6.6 in.) Height: 4.69 cm (1.85 in.) Weight: 354 g (12.5 oz)
Power	48 V dc Power over Ethernet according to the 802.3 af standard guidelines
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	—20°C to 70°C (—4°F to 158°F)

Ordering Information

For further information, contact your local Nortel representative.

Nortel Wireless Local Area Network Mobile Adapter 2202

Overview

The Nortel Wireless Local Area Network (WLAN) Mobile Adapter 2202 complements the WLAN 2300 system and provides a cost-effective mobility upgrade for existing laptops or PDAs.

Ideal For

The Nortel WLAN Mobile Adapter is ideal for:

- customers investing in WLAN who want to upgrade an inventory of existing laptop computers or PDAs for wireless networking
- traveling employees that need to connect to the corporate network to access information and resources
- enterprises that want to upgrade their existing WLAN Adapters to support 802.11i

Business Challenges

The business challenges to consider when deciding to purchase a Nortel WLAN Mobile Adapter are:

- Does your business want to improve the productivity of traveling employees?
- Does your business want to extend the life of existing assets?
- Does your business want to reduce the cost of mobile connectivity for your employees?

Typical Applications



- The WLAN Mobile Adapter 2202 provides instant wireless networking for laptop computers and PDAs.

Key Points

The key points of the Nortel WLAN Mobile Adapter include:

- The WLAN Mobile Adapter 2202 provides 802.11 a/b/g connectivity for complete user mobility and flexibility.
- The credit card-sized multimode network adapter fits into a laptop computer or PDA.

Features and Benefits

The Mobile Adapter 2202 provides:

- **high speed wireless LAN connection** at 54 Mb/s for 802.11 of 802.11g in standard mode
- **enhanced "Super A/G mode"** for high-speed data throughput speed up to 108 Mb/s for 802.11a or 802.11g in Super A/G mode
- **backward compatibility** to the IEEE 802.11b WLAN infrastructure
- **wireless data encryption** with 64-bit, 128-bit, or 152-bit encryption
- **Wi-Fi Protected access** supported
- **hardware AES Accelerator** for Advanced Encryption Standard (AES)
- **built-in dual diversity antenna** on a built-in card
- **seamless roaming** within the IEEE 802.11a, 802.11b, or 802.11g WLAN infrastructure
- **adjustable power levels** for cell sizing on 802.11a/b/g

Technical Specifications

	Mobile Adapter 2202
Frequency Band	802.11a Radio: 5 GHz 4.90 – 5.00 GHz for Japan 5.15 – 5.25 GHz (lower band) for U.S. and Canada, Japan 5.25 – 5.35 GHz for US and Canada 5.4 – 5.725 GHz for Europe 5.725 – 5.850 GHz for US and Canada 802.11 g Radio: 2.4 GHz 802.11 b Radio: 2.4 GHz U.S.: FCC 2412–2462 MHz (Ch1-Ch11) Canada: IC 2412–2462 MHz (Ch1-Ch11) Europe : ETSI 2412–2472 MHz (Ch1-Ch13) Japan: STD –T66/STD–33 2412-2484 MHz (Ch1-Ch14) Frequency selection varies according to current local regulations
Operating Channels Supported	2.4 GHz (802.11b) U.S. and Canada: 11 (1–11 with 3 nonoverlapping channels) Major European countries: 13 (1–13 with 3 nonoverlapping) Japan: 13 (1–13) 5 GHz (802.11a) U.S. and Canada: 12 nonoverlapping channels 5.15–5.35 GHz, 5.725–5.825 GHz Major European countries: 19 nonoverlapping channels 5.15–5.35 GHz, 5.47–5.725 GHz Japan: 4 nonoverlapping channels 5.15–5.25 GHz 802.11g U.S. and Canada: 11 channels in base mode ETSI, Japan: 13 channels Channel selection varies according to current local regulations
Operating Voltage	dc operating voltage: 3.3 V nominal, 3.0 V minimum, 3.6 V maximum The power supplied to the WLAN-Mobile Adapter 2202 shall not exceed 15 W under normal or fault operation.
Power Consumption (3.0V nominal)	11a (Normal): Tx: 1680 mW; Rx: 810 mW; Standby: 60 mW 11a (Turbo): Tx: 1800 mW; Rx: 930 mW; Standby: 60 mW 11g (Normal): Tx: 1500 mW; Rx: 840 mW; Standby: 60 mW 11g (Turbo): Tx: 1620 mW; Rx: 930 mW; Standby: 60 mW 11b (Normal): Tx: 1470 mW; Rx: 750 mW; Standby: 60 mW
Current Consumption	11a (Normal): Tx: 560 mA; Rx: 270 mA; Standby: 20 mA 11a (Turbo): Tx: 600 mA; Rx: 310 mA; Standby: 20 mA 11g (Normal): Tx: 500 mA; Rx: 280 mA; Standby: 20 mA 11g (Turbo): Tx: 540 mA; Rx: 310 mA; Standby: 20 mA 11b (Normal): Tx: 490 mA; Rx: 250 mA; Standby: 20 mA

Output Power	Worldwide 2.4 GHz: 18 dB/m (—65 mW) peak power U.S. 5 GHz a. 5.150–5.250: peak power to 50 mW (17dB/m) per FCC 15.407 specification (UNII band operation) b. 5.250–5.350: peak power to 250 mW (24 dB/m) per FCC 15.407 specification (UNII band operation) c. 5.470–5.725: not allowed d. 5.725–5.850: peak power to 1 W (30 dB/m) per FCC 15.247 specification (ISM band operation) Europe 5 GHz a. 5.150–5.250 and 5.250–5.350: European regulations limit power; this limitation varies by current local regulations b. 5.470–5.725: European regulations limit power; this limitation varies by current local regulations Japan 5 GHz a. 5.150–5.250: Output power varies according to current local regulations b. 5.250–5.350: not allowed c. 5.470–5.725: not allowed d. 5.725–5.825: not allowed Maximum power setting varies according to current local regulations
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Ordering Information

For further information, contact your local Nortel representative.

Nortel Voice over Wireless Local Area Network Telephony Manager



Overview

The Nortel Voice over Wireless Local Area Network (VoWLAN) portfolio gives users the freedom to roam from floor to floor in a building or around a campus, while remaining accessible and connected through a powerful, discrete, lightweight device. With simple, multifunction handsets integrated into the site WLAN infrastructure, workers can stay in contact with customers, co-workers, clients, and suppliers while covering more ground, answering questions quickly, and making fast decisions.

The VoWLAN solution comprises a Nortel Communication Server such as the Nortel Business Communications Manager 200/400, the Communication Server 1000, or the Communication Server 2100. The VoWLAN solution is built on a standards-based IEEE 802.11 WLAN infrastructure (for example, Nortel WLAN 2300 series), Nortel UNiStim-based WLAN Handsets (WLAN Handsets 2210, 2211 and 2212), and key network components to enhance the user's experience within the overall solution offering.

This section reviews the Nortel WLAN Telephony Manager 2245 that provides Quality of Service (QoS), admissions control and enhanced device battery-power conservation for the VoWLAN solution.

The Nortel WLAN IP Telephony Manager 2245 is available in three models depending on the number of users supported. A specific WLAN IP Telephony Manager 2245 model is available for each of the following capacity levels:

- WLAN IP Telephony Manager 2245—10 Users (supports up to 10 users)
- WLAN IP Telephony Manager 2245—20 Users (supports up to 20 users)
- WLAN IP Telephony Manager 2245—500 Users (supports up to 500 users or 80 simultaneous calls)

Each WLAN IP Telephony Manager 2245 model requires a local power supply (ordered separately). The WLAN IP Telephony Manager 2245 can either be wall-mounted or rack-mounted (rack-mounting requires a separately ordered kit). The WLAN IP Telephony Manager 2245 can process up to 80 simultaneous calls. If greater capacity is required, multiple units can be used in a master-slave arrangement.

Nortel recommends that customers consider future expansion needs when deciding which model to purchase, as the models cannot be upgraded in capacity. Expanding capacity beyond the limit of a current unit requires that a new unit be purchased and added to the network.

Ideal For

The Nortel VoWLAN Telephony Manager is ideal for the following:

- small, medium, and large enterprises that want to build on standards-based IEEE 802.11 WLAN infrastructures for VoWLAN applications for enhanced mobility and productivity
- sites needing VoWLAN communications that offer Quality of Service (QoS), admissions control, and battery-power conservation over their wireless LAN infrastructures to provide the user with the best quality of experience
- organizations in industries such as health care, retail, manufacturing, hospitality, education, and government where mobile

access to real-time voice communications is a key business requirement

Business Challenges

Many organizations want to add VoWLAN services to their existing WLAN networks or plan to deploy a converged WLAN and need the mobile user's experience to be similar to other VoIP wireline services. The challenge is that many IEEE 802.11 WLAN implementations do not have the sufficient mechanisms or techniques in place to provide the necessary QoS across the shared WLAN infrastructure resources.

Typical Applications

The Nortel WLAN Telephony Manager 2245 enables standards-based IEEE 802.11 WLAN infrastructures that are certified with Voice Interoperability for Enterprise Wireless (VIEW) to support VoWLAN communications. The WLAN Telephony Manager 2245 is a required network component for the Nortel VoWLAN solution as it manages the voice prioritization on the wireless network and maintains the connection between the WLAN handsets and the Nortel communication server.

Key Points

The Nortel WLAN IP Telephony Manager 2245 is a network appliance that works with the standards-based IEEE 802.11 WLAN to enhance the user's experience within the overall solution offering. This is accomplished by the WLAN IP Telephony Manager 2245 as it implements several QoS-related enhancements and techniques to the overall VoWLAN solution.

One such component is the SpectraLink Voice Protocol (SVP), which is used within the WLAN IP Telephony Manager 2245 to provide the necessary packet prioritization of the radio frequency (RF) transmission from the WLAN access point to the WLAN handset. While the Nortel UNISTim protocol is used for audio and data communications between a Nortel WLAN handset and the Nortel communication server, all UNISTim packets to and from the Nortel WLAN Handsets 2210, 2211, and 2212 pass through the Nortel IP Telephony Manager 2245. The IP Telephony Manager 2245 encapsulates the packets for prioritization as they

are routed to and from the supported Nortel communication server.

The Nortel WLAN IP Telephony Manager 2245 is required for QoS because the current IEEE 802.11 standards provide limited mechanisms and techniques for voice-optimized WLAN implementations, such as differentiating audio packets from data packets, admissions control, and battery power conservation. The emerging 802.11e standard is intended to eventually provide all the functionality of the Nortel IP Telephony Manager 2245, thus ensuring high-quality voice in a mixed client environment, but the current state of the standard must address more than QoS for the VoWLAN solution. Additionally, even when all the IEEE 802.11e components are available and ratified under the standard, they must be deployed within both the WLAN infrastructure and the device (WLAN handset).

Features and Benefits

The role of QoS is to deliver consistent voice quality over a broad range of conditions, including number of users and data traffic loads. The Nortel WLAN IP Telephony Manager 2245 provides these QoS mechanisms and techniques by:

- encapsulating voice packets to allow prioritization in access points
- priority queuing for voice packets
- minimizing random back-off after packet transmission

Additionally, the WLAN IP Telephony Manager 2245 provides the needed admissions control to limit the number of handsets that can associate with an access point (to avoid overloading the access point throughput capacity) and enhance the battery power conservation of the device to increase talk and standby times of the WLAN handset.

Market Information

Nortel is the only vendor in the industry with the wealth of experience in voice, data, wireless, and security technologies for enterprises and service providers. This experience uniquely positions Nortel VoWLAN as best-in-class for the ability to deliver a mobile network that provides a secure, adaptable, multiservice solution.

Nortel is positioned exclusively to address the requirements that focus on security, manageability and high availability. Nortel core strengths and extensive research and development expertise across the wireless, service provider, and enterprise businesses are capitalized on to extend this knowledge into the wireless enterprise market. Nortel is the only vendor that can deliver a secure wireless platform that spans the world of private and public wireless networks.

Ordering Information

For further information, contact your local Nortel representative.

Nortel WLAN Application Gateway 2246



Overview

The Nortel Voice over Wireless Local Area Network (VoWLAN) portfolio gives users the freedom to roam from floor to floor in a building or around a campus, while remaining accessible and connected through a powerful, discrete, lightweight device. With simple, multifunction handsets integrated into the site WLAN infrastructure, workers can stay in constant contact with customers, co-workers, clients, and suppliers, cover more ground, answer questions quickly, and make fast decisions.

The VoWLAN solution comprises the Nortel Communication Server (Nortel Business Communications Manager 200/400, Communication Server 1000, or Communication Server 2100), standards-based IEEE 802.11 WLAN infrastructures (Nortel WLAN 2300 Series), Nortel UNISim-based WLAN Handsets (WLAN Handsets 2210, 2211 and 2212), and key network components to enhanced the user's experience within the overall solution offering.

The WLAN Application Gateway 2246 is available in six models depending on the number of users supported. A specific WLAN Application Gateway 2246 model for each of the following capacity levels:

- WLAN Application Gateway 2246—64 Users (supports up to 64 users)
- WLAN Application Gateway 2246—128 Users (supports up to 128 users)
- WLAN Application Gateway 2246—256 Users (supports up to 256 users)
- WLAN Application Gateway 2246—512 Users (supports up to 512 users)
- WLAN Application Gateway 2246—1024 Users (supports up to 1024 users)
- WLAN Application Gateway 2246—10 000 Users (supports up to 10 000 users)

Each WLAN Application Gateway 2246 model requires a local power supply (Ordered separately). The WLAN Application Gateway 2246 can either be wall-mounted or rack-mounted (rack-mounting requires a separately ordered kit).

Nortel recommends that customers consider future expansion needs when deciding which model to purchase, as the models cannot be upgraded in capacity. Expanding capacity beyond the limit of a current unit requires that a new unit be purchased and added to the network.

This section reviews the Nortel WLAN Application Gateway 2246 that enables third-party software applications to communicate with the Nortel WLAN handsets.

For information about WLAN Handsets, see the IP Clients section in this guide.

Ideal For

The Nortel WLAN Application Gateway is ideal for:

- small, medium, and large enterprises that want to enhance mobile workers access to critical information, to control machines, or to check the status of functions from external systems using their WLAN Handsets for enhanced productivity
- sites that need to add data messaging capabilities to a VoWLAN-based solution to keep mobile workers informed and react quickly to situations
- organizations in industries such as health care, retail, manufacturing, education, and government where mobile access to online information is a key business requirement

Business Challenges

Many organizations have mobile staff who need to access critical messages, information, or systems from their WLAN handset regardless of where they are in the campus. These mobile personnel need to stay in constant contact, cover more ground, receive and retrieve important information quickly, and make fast decisions.

Typical Applications

The Nortel WLAN Application Gateway 2246 works as a two-way messaging device that allows integration with other enterprise systems to allow mobile workers with WLAN handset to receive and retrieve important information from external systems. Here are some examples of applications in various markets:

Health care

- Access patient pharmaceutical records.
- Receive text messages from nurse call systems.
- Receive e-mail messages from remote test labs.

Retail

- Look up merchandise prices.
- Access inventory.

Manufacturing

- Use handsets to relay alarms from malfunctioning equipment.
- Permit managers to monitor production output.

Education

- Broadcast important messages or alerts to specific personnel or staff regardless of their locations on campus.
- Help improve safety and security.

Hospitality

- Easily track housekeeping room availability and schedules.
- Remotely control maintenance systems lighting, heating, and alarms.

Contact Centers

- Review queue statistics.
- Receive alarms when metrics exceed thresholds.

Key Points

The Nortel Application Gateway 2246 is an OAI, a messaging protocol interface that enables third-party software applications to communicate with Nortel WLAN Handsets 2210, 2211, and 2212. Many applications are currently integrated with OAI. The development of other applications continues to meet specific vertical market needs. Nortel offers a developer's package that provides the software necessary to easily integrate and test applications.

Features and Benefits

With the Nortel Application Gateway, you can:

- Enable third-party software applications to communicate with WLAN Handsets.
- Capitalize on wireless LAN infrastructure for converged voice and data applications.
- Improve mobility, responsiveness, and productivity.
- Integrate data and messaging capabilities with voice applications.
- Provide soft-key feature access.

Market Information

Nortel is the only vendor in the industry with the wealth of experience in voice, data, wireless and security technologies for enterprises and service providers. This experience uniquely positions Nortel WLAN IP Telephony as best-in-class for the ability to deliver a mobile network that provides a secure, adaptable, multiservice solution.

Nortel is positioned exclusively to address the requirements that focus on security, manageability, and high availability. Nortel's core strengths and extensive research and development expertise across the wireless, service provider, and enterprise businesses are capitalized on to extend this knowledge into the wireless enterprise market. Nortel is the only vendor that can deliver a secure wireless platform that spans the world of private and public wireless networks.

Ordering Information

For further information, contact your local Nortel representative.

Nortel Wireless Mesh Network Portfolio



Overview

Nortel Wireless Mesh Network solution is a new, enhanced WLAN architecture that redefines the boundaries of WLAN technology, enabling wireless connectivity for enterprises and public end users. The Nortel Wireless Mesh Network is well suited to provide broadband wireless access in areas that traditional WLAN systems cannot cover and where the seamless voice and mobility capabilities of cellular systems are unnecessary. Nortel Wireless Mesh Network includes a peer-to-peer architecture to backhaul data wirelessly to wired broadband networks. The architecture includes smart antennas, integrated routers, adaptive routing, and security capabilities. With powerful business models for government applications, enterprises, and service providers, this latest addition to the Nortel WLAN portfolio combines the best of Nortel wireless and wireline solutions for reliable wireless access.

The Nortel Wireless Mesh Networks solution consists of the following elements:

- Nortel **Wireless Access Point 7220** forms wireless mesh between multiple Nortel Wireless Access Point 7220s using autodiscovery and self-routing technology. This unit also acts as a WLAN Access Point for user access.
- Nortel **Wireless Gateway 7250** provides user mobility and data traffic security between access points.
- Nortel **Wireless Bridge 7230** provides a cost-effective point-to-point broadband wireless transmission system. The 7230 provides Ethernet services for transmission over 5.8 GHz unlicensed bands and is suitable for deployment in FCC-regulated countries.
- Nortel **Enterprise Network Management System** provides centralized facilities for monitoring and managing network operations using network management software.

Ideal For

The Nortel Wireless Mesh Network portfolio is ideal for WLAN coverage of large open areas, indoors and outdoors, and should be considered where Ethernet cabling is prohibitive to install or to reduce the requirement for leased backhaul. Deployment scenarios that are particularly well suited for Nortel Wireless Mesh Network include:

- campus environments (enterprises and universities), manufacturing, shopping centers, airports, sporting venues, and special events
- military operations, disaster recovery, temporary installations, and public safety
- municipalities, including downtown cores, residential areas, and parks
- carrier-managed services in public areas or residential communities

Business Challenges

The business challenges to consider when deciding to purchase the Nortel Wireless Mesh Network service are:

- Do you need to provide Internet access outdoors but are finding cabling costs and

leased backhaul costs too high?

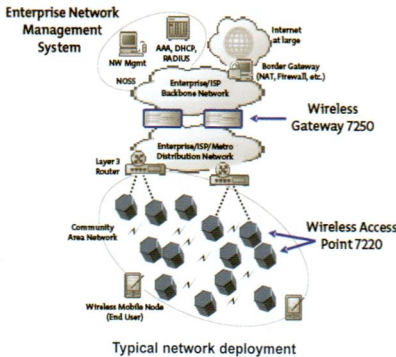
- Do you need to provide Internet access indoors but have no existing LAN and the cost of installing cabling is prohibitive?
- Do your currently deployed hot spots satisfy your user's desire for ubiquitous access or for mobility?
- Do you want to extend your LAN with WLAN technology but are concerned about security?
- Do you need to deploy quickly a network or install a temporary network at a low cost?
- Do you require a central management platform to monitor, configure, and control your WLAN deployment?
- Do you want a solution to build on consumer devices, for example, wireless handsets, and personal communications devices that are inexpensive, readily available, and already exist in large numbers in the market?
- Do you want to offer broadband access in a large area without investing in expensive radio spectrum?

Typical Applications

Areas where traditional WLAN systems cannot cover and where the seamless voice and mobility capabilities of cellular are unnecessary:

- **higher education:** cost-effective campus-wide university coverage for faculty and students
- **manufacturing:** wireless data applications to improve efficiency and to overcome building infrastructure challenges
- **public areas:** broadband connectivity for transient users with 802.11 wireless-enabled laptops and PDAs in airports, hotel, convention centers, shopping malls, sporting venues, special events, and more

Network Diagram



Typical network deployment			
Standalone • Few users • "Hotspot" • Low entry cost • Simple, but secure • Minimal management	Hybrid • Larger installations • Intelligent overlay • User existing APs • Multi vendor APs • Centralised security	Adaptive • Ubiquitous coverage • Green Field • Active security • Central management • Plug&play/grow	Mesh • Open spaces • Ubiquitous coverage • Reduced back haul • No existing infrastructure • Central management

The right solution for each customer environment

Key Points

The key points of the Nortel Wireless Mesh Network portfolio include:

- Uses standard IEEE 802.11 technology.
- Enables WLAN deployment and simplified coverage for vast open areas—indoors and

outdoors.

- Brings hot spots together into a community area network (CAN) to provide large homogenous coverage and seamless mobility within the CAN.
- Eliminates extensive Ethernet cabling or leased lines by using wireless communication

- between access points in the mesh network.
- Enables wireless backhaul using high gain directional antennas in a circular array to provide high coverage and throughput while minimizing interference.
- Brings autoconfiguration and centralized management capabilities to simplify network operations.
- Avoids service outages by providing efficient routing using autodiscovery and self-healing algorithms.
- Provides a highly secure environment for both end users and the network.

Features and Benefits

Nortel Wireless Mesh Network solution provides a cost-effective method for broadly extending WLAN coverage into business and end user markets:

- Based on unlicensed 802.11 technologies, the Nortel Wireless Mesh Networks solution allows service providers to add wireless broadband services to their portfolios without needing them to invest in expensive radio spectrum.
- The solution builds on existing and growing acceptance of using wireless technology for end-user applications, business applications, service providers, and enterprises. All of these can capitalize on consumer devices such as inexpensive, readily available, existing wireless handsets and personal communications devices.
- The Nortel Wireless Mesh Network solution uses wireless links for backhaul, allowing enterprises or service providers to install WLAN with little new Ethernet cabling or other backhaul facilities.
- The solution helps service providers reduce costs for backhaul or leasing data transportation facilities by using wireless links.
- Service providers and enterprises can expand their WLAN coverage to areas where network limits or cost makes it prohibitive with other solutions.

The Nortel Wireless Mesh Network solution provides a secure platform for WLAN access and supports flexible capacity, coverage, and availability:

- The solution includes the latest security standards to protect user access and protects both the network and the user by providing security on the wireless transit links between access points.
- The solution provides self-organization and autoconfiguration capability to increase capacity, coverage, and availability, which means that deployment entails adding Nortel Wireless Access Point 7220s.
- The solution requires minimal cabling, making it easy to set up temporary installations for emergencies, special events, and other activities.

This solution provides specific benefits for enterprises, service providers, wireless Internet service providers (WISPs) and multiple layers of government.

- **Enterprises:** the Nortel Wireless Mesh Network solution is ideal for WLAN coverage of large open areas, both indoor and outdoor, and should be considered in areas where no Ethernet cabling exists and is prohibitive to install.
- **Service providers:** the Nortel Wireless Mesh Network solution enables new revenue opportunities through differentiated service offerings, extended service reach, and increased use of high-speed data into existing and new markets.
- **Wireless Internet Service Providers:** the Nortel Wireless Mesh Network solution offers rapid, flexible, and cost-effective deployment to provide community-based high-speed wireless Internet access as an enhancement or alternative to dial-up, DSL, or cable modem service.
- **Government:** the Nortel Wireless Mesh Network solution allows federal, municipal, or homeland security entities to cost-effectively build on the benefits of WLAN access in a wide range of areas. Some examples are:
 - improved productivity of public safety and utility employees by moving the office to the field
 - enhanced security coverage at ports and

- border crossings
- permanent or temporary wireless access for disaster recovery, command posts, and other events

Market Information

Nortel designed the Nortel Wireless Mesh Network solution to significantly reduce the cost to transport high-speed wireless data from Wi-Fi networks to broadband networks, building on the Nortel vision to deliver wireless everywhere.

The Nortel Wireless Mesh Network provides a cost-effective, secure solution that enables new business models for wireless LAN. Nortel capitalizes on its leadership as one of the most innovative wireless data network providers to deliver secure, seamless, wireless roaming capabilities across converging public and private networks, as well as hot spot environments to end users, demonstrating "Business without Boundaries."

Technical Specifications

	7220 Access Point
Wireless AP 7220 Access Link 802.11b (2.4 Ghz) Radio System	Center frequency • 2412 MHz to 2462 MHz (North America) Data rate: 11 Mb/s maximum • Supports 1, 2, 5.5, 11 Mb/s (IEEE 802.11b) • IEEE 802.11b standard rates Access antenna options • Colinear whip, 5 dBi nominal antenna, SMA connectors • PIFA integrated antenna, 1 dBi nominal, SMA connectors Radiated EIRP • +21 dBm typical (PIFA integrated antenna) • +25 dBm typical (co-linear whip antenna)
Wireless AP 7220 Transit Link 802.11a (5 Ghz) Radio System	Center frequency • 5740 MHz to 5840 MHz Data rate: 54 Mb/s maximum • Supports 6, 9, 12, 18, 24, 36, 48, and 54 Mb/s • IEEE 802.11a standard rates Antenna system gain from radio module card inside the unit • 10 dBi nominal Radiated EIRP • +24 dBm typical at 54 Mb/s • +28 dBm typical at 6 Mb/s
Environmental Specifications	• Operating temperature range: –40°C min to 50°C (–40°F min to 122°F) maximum
Regulatory	• Weather rating: NEMA 4, IP56/Category 2 testing • Safety: UL, CSA • Emissions/radio: FCC Class B, Part 15, RSS 210
Hardware Specifications	• Wired network interface: Autosensing 10/100 Base-T • Ethernet, 1.5 kV surge protection per IEC60950 • Power input nominal: 100 V–240 V ac (45Hz–65Hz) • Power consumption: Operating: • Indoor or outdoor > 0°C (> 32°F) 8 W typical • Outdoor < 0°C 8 W–14 W (–40° to 0°C, –40° to 32°F) Startup: • Indoor or outdoor > 0°C (> 32°F) 8 W typical • Outdoor < 0°C 24 W (short duration) 8 W–14 W (–40° to 0°C, –40° to 32°F) Dimensions (without mounting brackets or antennas) • Height: 30.48 cm (12 in.) • Diameter: 20.32 cm (8 in.) • Weight: 2.4 kg (5.3 lb) • Color: Gray

Optional Accessories	• Mounting brackets (right-angle or straight horizontal attachment) • 25 m (82 ft) CAT5 Ethernet cable for network access point (NAP) operation (indoor/outdoor version) • Street light photo-electric control power tap "luminaire" 120/208/240 V • 13 dBi and 18 dBi TL external antennas
	Component Specifications
Standard	• 128 MB memory • Processor – 850 MHz • PCI expansion slot – one (available for additional Ethernet interface or hardware accelerator card) • LAN/WAN interfaces – Two 10/100 Base-T Ethernet – Management or console (DB-9)
Optional	• One additional 10/100 Base-T Ethernet interface (provides additional LAN/WAN connectivity, if required by network design) • 128 MB RAM upgrade • Hardware encryption accelerator card
Physical Specifications	• Length: 53.3 cm (21 in.) • Width: 43.8 cm (17.25 in.) • Height: 8.9 cm (3.5 in.) • Weight: 4.5 kg (10.0 lb)
Operating Environment Specifications	• Electrical: 90–264 V ac, 2.0 ac 90 V ac, 47–63 Hz • Temperature: 0° to 40°C (32° to 104°F) • Relative humidity: 10–90% noncondensing
7230 Wireless Bridge	
Data Rate	Up to 48 Mb/s
Transmission Range	Up to 40 km (25 mi) with integrated antennas Up to 80 km (50 mi) with optional external antennas
Frequency	5.725–5.850 GHz
Channel Bandwidth	20 MHz
Modulation	OFDM–BPSK, QPSK, 16 QAM, 64 QAM
Transmit Power	FCC: 18 dBm (max)
Physical Dimensions	Outdoor Unit (with integrated antenna) Height: 30.5 cm (12 in.) Width: 30.5 cm (12 in.) Depth: 5.8 cm (2.3 in.) Weight: 1.5 kg (3.3 lb)
Environment	Outdoor Unit and External Antenna: Temperature: –35° to 60°C (–31° to 140°F)

Ordering Information

For further information, contact your local Nortel representative.

Nortel Security Portfolio

Leaders in today's organizations have three expectations for network security. First, they need insurance, protection from threats and attacks. They need to secure corporate information assets. They want to know hackers cannot compromise the network to stage an attack, or to serve illegal or illicit content. Second, leaders must have performance, speed, and scale with security. Organizations use applications and services to achieve high productivity, reach new markets, partner for success, and serve clients with new levels of service. Trading performance for security is not an option. When deploying new applications and services such as Voice-over IP (VOIP), Session Initiation Protocol (SIP), and multimedia, user experience is imperative. Third, today's leaders need compliance. They must be able to show that valid, documented security policies are in place, and that the policies are enforced and monitored. This demand for compliance comes from clients, owners, shareholders, regulators, and partners.

The world of security has changed. It is more than a firewall and VPN. Today, security is an important factor in every aspect of the network. From network access to application and service performance, security must be part of the planning, designing, and operating practices. Nortel responds with a security strategy to address these needs. Nortel security products optimize security for applications and services, including VoIP, SIP, wireless, and multimedia without affecting network performance and resiliency. Organizations cannot afford to compromise their business-critical networks and information. With Nortel, organizations can deploy and use new applications and services with confidence, trusting that all communications are secure and protected. Nortel delivers an adaptive defense against hacks, attacks, worms, and viruses. Critical applications and services are protected and prioritized. The response to threats is immediate and effective. Throughout the network, security policies are implemented, enforced, and adapted to block real-time threats. New devices, increased mobility and increasingly sophisticated threats make security policy and enforcement more important than ever. Nortel delivers solutions for detection and response.

With Nortel, total end-point integrity is the mission. Productivity is protected with devices continuously analyzed for threats. As a result, the network and associated devices are effectively protected from infections and attacks to increase availability and performance. In addition, Nortel end-point solutions are simple and cost-effective making them easy to deploy and support. Nortel knows that full security management is required to maintain operational efficiency. Open solutions deliver active defense responses with automatic detection, blocking, and repair. The Nortel partnership program certifies cost-effective support for multivendor solutions and policy-based central solutions for easy provisioning and auditing. Comprehensive reporting for ongoing security analysis and follow-up completes the suite of required management capabilities.

The Nortel difference:

1. A long history of delivering the world's most resilient and high-performance networks.
2. An in-depth understanding of application and service deployment, including VoIP, SIP, wireless, and multimedia.
3. Unmatched experience building and deploying wireless network solutions for organizations and service providers.
4. Real-world security experience and innovation with over 100 million VPN customers, the first accelerated firewall, and leadership in secure routing.

Nortel helps its customers build secure networks to deliver useful services and applications.

Resilience and performance help to ensure availability and trust. Analysis, reports, and flexible deployment options help customers implement and comply with their security policies. Nortel experience in voice, data, VOIP, SIP, multimedia and wireless networks is unmatched, as is the Nortel commitment to continuous security innovation for these networks.

To learn more about the products Nortel offers that put security first, refer to the following sections in this Guide:

- Nortel Application and Web Switching portfolio
- Nortel Secure Network Access portfolio
- Nortel VPN portfolio
- Nortel Secure Router portfolio
- Nortel Switched Firewall portfolio
- Nortel Threat Protection System
- Nortel Multimedia Security

Nortel Application and Web Switching

Nortel Web Switches have been number one in the fixed Layer 4 through 7 switch market position for five years straight (Dell'Oro). They consistently outperform all other manufacturers in the content-switching space and prove that brains and muscle are important. Enterprises, hosting and content providers, and e-businesses alike appreciate the scalability and robustness of the Nortel Ethernet Routing Switch Web Switching Module that provides the confidence that comes from using the best of breed.

The Nortel best-in-breed portfolio of application switches allows enterprises to contain and reduce operating costs and to defer or eliminate upgrades to the server and application platforms. These Nortel switches deliver functionality and application performance, and they maximize return on investment for the enterprise. The Nortel Application Switch, available in fast Ethernet and Gigabit Ethernet models, improves business productivity and simplifies operations while protecting the organization from denial of service attacks and application abuse. This Nortel switch portfolio also helps service providers efficiently enable differentiated services for businesses.

- Nortel Ethernet Routing Switch Web Switching Module (WSM)
- Nortel Application Switch portfolio
 - Nortel Application Switch 3408
 - Nortel Application Switch 2424
 - Nortel Application Switch 2424-SSL
 - Nortel Application Switch 2216
 - Nortel Application Switch 2208

Nortel Ethernet Routing Switch Web Switching Module



Overview

The Nortel award-winning Layer 4 through 7 switches are industry-trusted content switches that specifically meet the needs of demanding businesses, and deliver Layer 2 and 3 switching, plus advanced Layer 4 through 7 processing with full wire-speed throughput on every port. Nortel Layer 4 through 7 switches offer local and global server load balancing, application redirection, device load balancing (such as firewall, cache, VPN, link, SSL accelerator), active-active high availability configurations, bandwidth management, class of service, and sophisticated security services (denial of service and application abuse protection, level 7 deny filters).

The Nortel Ethernet Routing Switch Web Switching Module (WSM) builds on the carrier-grade reliability and high port density of the Nortel Ethernet Routing Switch 8600 and enables application switching on any port within the system using sophisticated Layer 4 through 7 processing. The WSM contains many of the capabilities of the award-winning stackable Nortel Application Switches in a modular format that is affordable, scalable, and easy to customize for every user's unique needs. This combination creates a complete, high-capacity, carrier-class switching system of unprecedented scale. New features within the code include enhanced health-checking capabilities, intrusion-detection system load balancing, an increase in access filters, and the ability to perform switching based on a combination of multiple Layer 7 attributes—among others. The Nortel WSM has four external gigabit SX Ethernet or 10/100 TX ports. Install multiple modules (up to six) into a single 10-slot chassis. The Nortel Ethernet Routing Switch 8600 that is enabled with a Nortel WSM provides a high-density application-switching platform that can support up to 340 10/100 Mb/s or 116 10/100/1000 Mb/s ports that are Layer 2 through 7 enabled.

Ideal For

The Nortel Ethernet Routing Switch 8600 with a Nortel WSM is ideal for enterprises, hosting and content providers, e-businesses, and service providers that require a high-performance switching solution for IT data centers, server farms, and network and hosting infrastructures. Further, any business with an existing 8600 can easily turn its current high-density Layer 3 switches into a highly intelligent, content-aware application switch with full carrier-class resilience.

Business Challenges

Any business that builds highly scalable Web or network infrastructures or that requires the ability to intelligently manage and control the flow of data can benefit from this product. Load balancing services on any TCP or UDP port, content switching, and bandwidth management are key services of Nortel Level 4 through 7 switches. In addition, deployment of Layer 4 through 7 switches is the key enabler for value added services such as caching, SSL offload, high availability, and content routing.

Typical Applications

To provide the intelligence, scalability, resilience, and resource optimization to any network, data center, or Web and application server, the Nortel WSM offers many applications that can run concurrently on a single switch.

These applications include:

- server load balancing
- global server load balancing
- cache redirection
- application redirection (including SSL)
- bandwidth management
- content intelligent load balancing
- firewall load balancing
- high availability
- streaming media load balancing
- intrusion detection load balancing
- wireless load balancing
- VPN load balancing
- domain name service Layer 7 load balancing
- layer 7 deny filtering for network and device protection (Web switches only)
- denial of service protection

- high speed filtering and NAT
- application abuse protection

Key Points

- Combines the port capacity and density of the Ethernet Routing Switch 8600 with Nortel content-aware switching technology to turn any existing Layer 2 through 3 Ethernet 8600 platform into a highly intelligent, content-aware device for Layer 2 through 7 Web switching.
- Provides local and global server load balancing and health checks, to optimize existing server infrastructure and to minimize costs.
- Load balancing and application redirection, combined with Layer 3 and 4 resiliencies (VRRP), facilitate improved application availability and a fully redundant Nortel Ethernet Routing Switch 8600.
- Enabled firewall and VPN load balancing, that can run simultaneously with server load balancing for economical security deployment without bottlenecks.
- Content intelligent switching and true session-level persistence to deliver maximum profitability while minimizing infrastructure impact.
- Enhanced security without degrading site performance using content filtering, advanced Layer 4 through 7 Delayed Binding and industry-leading application support for firewall, VPN and Intrusion Detection System (IDS) load balancing.
- Meters, controls, and accounts for bandwidth use by client, server farm, virtual service, application, user class, content type, and other traffic classes that support guaranteed minimum, metered available, and maximum burst bandwidth rates.
- Integration into the Nortel Ethernet Routing Switch 8600 for network device consolidation and ease of management.
- Due to an array of line cards, allows connectivity flexibility to multiple technologies including Ethernet 10/100, Gigabit Ethernet, CWDM, ATM, and POS for content intelligence regardless of connectivity type.
- Supports unique features to enable new, highly profitable services such as streaming

media, wireless Internet, and intrusion-detection system load balancing.

- Sophisticated security services such as denial of service and application abuse protection, Layer 7 denial filters, high-speed filtering, and NAT.

Features and Benefits

- High-performance switching.
- Server, firewall, cache, WAN gateway, virtual private network, wireless application protocol, real-time streaming protocol, domain name service, and intrusion detection server load balancing.
- Full inspection of URLs, cookies, and host headers across multiple requests and responses.
- TCP, UDP, HTTP, FTP, SSL, SMTP, LDAP, DNS, RADIUS, WAP, RTSP, Telnet, and NNTP and IP server load balancing.
- Application redirection for any traffic type, including wireless.
- Persistent connections using multiple Layer 4 through Layer 7 parameters.
- Comprehensive server health checks for content verification and availability.
- Gigabit-class, content-intelligent bandwidth management enables SLAs and use-based services.
- Bandwidth, link, hash, least connections, maximum connections, and round robin load balancing metrics for unparalleled infrastructure optimization.
- Full network address translation enables multisite load balancing and traffic redirection.
- Global server load balancing to distributed servers based on health, user proximity, server weights and response time.
- Virtual matrix architecture enables dynamic use of all processors and memory.
- Complete site redundancy using active-active, active-standby, hot-standby, and stateful failover for high availability.
- Up to 256 virtual servers per module.
- Up to 1024 application servers per module.
- Up to 1024 services per module.
- Up to 2000 packet filtering rules per port.
- Up to concurrent 512 000 Layer 4 through 7 sessions per module.

Market Information

Many award-winning Nortel Application Switch features are delivered and enhanced with the Nortel Ethernet Routing Switch Web Switching Module for the Nortel Ethernet Routing Switch 8600. The Nortel WSM builds on the same OS software platform as Nortel switches, which are in use across all Nortel content switching products. In addition, using the Nortel Ethernet Routing Switch 8600 allows the business to benefit from the rich feature set and performance provided by

this platform. The ability to connect to an array of technologies allows for content networking and application switching to be deployed into new areas to provide enhanced network optimization and productivity for enterprises and differentiation for high-end service providers.

Technical Specifications

Components and interfaces	• Four external Gigabit Ethernet or 10/100 TX ports • Direct interface the Ethernet Routing Switch 8600 backplane • Up to eight Nortel Web Switch Modules per Ethernet Routing Switch 8600 chassis • Up to 336 10/100 Base-TX with 4 1000 Base-SX front-facing ports, OR • Up to 116 Gigabit Ethernet Ports (112-1000 Base-SX/LX/XD GBICs ports with 4-1000 Base-SX front-facing Nortel Web Switching Module ports), OR Up to 32 1000 Base-SX Ports
Performance specifications	• Mean Time Between Failure 80 000 hours • Frame Length 9000 (for WSM to WSM traffic) and 1900 through the 8600
Physical dimensions	Height: 3.8 cm (1.5 in.) Width: 3.8 cm (15.4 in.) Depth: 47.0 cm (18.5 in.)
Weight	(single module) approximately 4.5 kg (10 lb)
Environmental specifications	Operating temperature: 5° to 40° C (41° to 104°F) Storage temperature: —25° to 70° C (—13° to 158°F) Operating humidity: 85% maximum relative humidity, noncondensing Storage humidity: 95% maximum relative humidity, noncondensing Operating altitude: 10 000 ft (3024 m) maximum Storage altitude: 10 000 ft (3024 m) maximum Free Fall/Drop: ISO 4180-s,NSTA 1A Vibration: IEC 68-2-6/34 Shock/Bump: IEC 68-2-27-29
Processing capacity and performance	10 purpose-built WebICs 20 RISC Processors 80 MB of memory Web switching of 128 Gb/s Wire-speed filtering for more than 48 000 security and policy services Support for more than 4 million concurrent sessions at 2.4 million session per second

Ordering Information

For further information, contact your local Nortel representative.

Nortel Application Switch Portfolio



Overview

Nortel once again raises the bar in the intelligent networking arena with its best-in-breed portfolio of application switches. The Nortel Application Switch allows enterprises to contain and reduce operating costs and to defer or eliminate upgrades to the server and application platforms. A giant leap forward in application-aware networking, this Nortel solution enables multiapplication switching that allows enterprises to maximize existing investment in servers and networks through application-intelligent traffic management, load balancing, and sophisticated security services. Available in fast Ethernet and Gigabit Ethernet models, the Nortel Application Switch improves business productivity and simplifies operations while protecting the organization from denial of service attacks and application abuse. The Nortel Application Switch allows service providers to efficiently enable differentiated services for enterprise businesses. With integrated SSL acceleration, SSL VPN, security and high-performance content-aware switching, the Nortel Application Switch provides best-in-class application integration and return on investment.

Ideal For

- Enterprises that want to design their networks for business applications and maximize the return on their existing investments in servers and networks through application-intelligent traffic management, integrated application support, and sophisticated security features.
- Any organization that uses Web-enabled business applications (for example, ERP, CRM) or next-generation applications (for example, wireless LAN, VoIP, Web services), and wants to extend the reach of its business.
- Enterprises, hosting providers, content providers, e-businesses, and service providers that require high-performance switching for their IT data centers, network, and hosting infrastructures.
- Organizations that want to protect and enhance their business through increased on-line service availability and performance.
- Service providers who need to efficiently enable differentiated services for their enterprise customers.

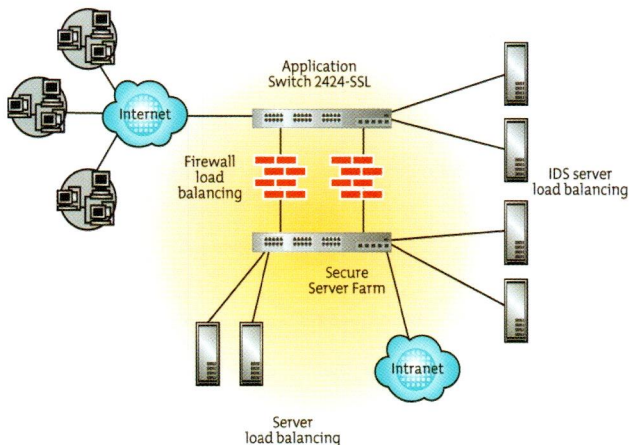
Business Challenges

- Do you want to rapidly deploy new online initiatives to enhance existing customer, partner, or employee services or to capture new markets?
- Are content prioritization, increased network and enhanced online security key to your business success?
- Do you want to contain and reduce operating costs and to defer or eliminate upgrades to the server and application platforms while delivering functionality, application performance, and maximum return on investment?

Typical Applications

- Enterprises that want to design their network for business applications and maximize the return on their existing investments in servers and networks through application intelligent traffic management, integrated application support, and sophisticated security features.
- Service providers who need to efficiently enable differentiated services for their enterprise customers.

Network Diagram



Key Points

Application Availability

- Multiple and Rapid Spanning Tree Protocols (MSTP and RSTP)
- Real Time Streaming Media (RTSP) load balancing
- Web Services (XML/SOAP) inspection/redirection
- High availability—such as active/active or active/standby
- Stateful failover with persistence
- WAN link multi-homing
- OSPF and BGP routing
- Scriptable health checking
- Support for Windows Terminal Services
- Support for IBM Enterprise Workload Manager
- Support for Oracle Enterprise Manager
- Support for Softricity SoftGrid

Application Performance

- Local and global server load balancing
- WAN link load balancing
- VoIP (SIP) call server load balancing
- Wireless Internet (WAP) load balancing
- Domain Name Server (DNS) load balancing

- Lightweight Directory Access Protocol (LDAP) server load balancing
- Server load balancing
- Cache redirection and load balancing
- Content-intelligent (Layer 4 through 7) switching
- Bandwidth management, shaping and rate limiting
- TCP multiplexing
- Rout optimization
- SSL Acceleration
- Support for IBM DataPower XML acceleration technology

Application Security

- Symantec Intelligent Network Protection with deep packet inspection
- Extensive denial of service (DoS) protection (TCP, IP, UDP, ICMP)
- Bogus IP (Bogon) filtering
- Detect and block high-profile threats through tight integration with Symantec Intelligent Network Protection
- Detect and block rogue instant messaging
- High-profile worm and threat protection
- Peer-to-Peer traffic inspection, redirection,

- bandwidth rate limiting
- Enforcement point for Nortel Threat Prevention System (TPS)
- SSL VPN
- SSL acceleration offload and load balancing
- Firewall load balancing
- Intrusion Detection System (IDS) load balancing
- Virtual Private Network (VPN) load balancing
- Application abuse protection
- Wire-speed filtering

Management

- Secure Management through authentication, authorization, and encryption of management information
- Virtual data center
- Open Application Programming Interface and standards-based XML interface
- Free Application Element Manager (ASEM) for managing multiple switches, ITM, and more.

- Multi-protocol IP switching based via support for RIP v1, SPPF, BGP, Spanning Tree, static routes, and more

Market Information

The key strength in Nortel applications switches is the single focus on the Nortel OS software used across all content switching products. This rich feature set makes sure that no threat of forklift upgrades or cross-product switches to provide functionality. The Nortel Application Switch consistently outperforms all other manufacturers in the content-switching space and proves that brains and muscle are important. A 2003 Tolly testing Layer 7 performance test* showed that the Nortel Application Switch outperformed Cisco and F5 switches with three to four times competitors' Layer 7 performance capacity. In addition, the simple manageability and strength of these Nortel switches exceed any competition and allow customers to deploy the switch with confidence.

Technical Specifications

Application Switches	3408	2424	2424-SSL	2216	2208
Total ports	12	28	28	18	10
10/100 Base-T	—	24	24	16	8
10/100/1000 Base-T	8	—	—	—	—
SFP-GBIC (Fiber or Copper GE)	4	4	4	2	2
IP routing interfaces	256	256	256	256	256
Virtual server support	1024	1024	1024	1024	1024
Real server support	1024	1024	1024	1024	1024
Policy filters	2048	2048	2048	2048	2048
Concurrent sessions	2 M	2 M	2 M	1 M	600 K
Layer 7 performance (sessions/second)	51 K*	51 K*	51 K*	30 K*	15 K*
Layer 4 performance (sessions/second)	110 K*	110 K*	110 K*	40 K*	20 K*
Integrated SSL acceleration (tps)**	No	No	Base: 300 Max: 1000	No	No

Integrated SSL VPN	No	No	Yes	No	No
Height (centimeters/ inches per RU)	4.45 cm (1.75 in.) per 1 RU	4.45 cm (1.75 in.) per 1 RU	4.45 cm (1.75 in.) per 1 RU	4.45 cm (1.75 in.) per 1 RU	4.45 cm (1.75 in.) per 1 RU
Network protocol and standard Compatibility	10/100/1000 Base-TX (IEEE 802.3) 1000 Base-SX/LX (IEEE 802.3) Spanning Tree (IEEE 802.1d) Logical link control (IEEE 802.2) Flow control (IEEE 802.3x) Link negotiation (IEEE 802.3z) VLANs (IEEE 802.1Q) Frame tagging (IEEE 802.1Q) on all ports when VLANs have SNMP v3 enabled. IP RIPv1 BGP v4 OSPF TFTP (RFC 783) BootP (RFC 1542) BootP (RFC 951) Telnet (RFC 854) EtherChannel-compatible trunking				
Power specification: measurement	Autoranging power supply: 100–240 V ac @ 3.5 Amps, 50–60 Hz Maximum power consumption: 250 Watts				
Environmental condition: operating specification	Temperature: 0° to 40°C (32° to 104°F) Relative humidity: 85% maximum, noncondensing				
Certifications	EMC U.S.: FCC Part 15, Subpart B Class A Australia: AS/NZS CISPR 22:2002 Canada: ICES-003 Japan: VCCI Class A Europe: EN 300 386 v1.3.1 (2001-09) Taiwan: BSMI Registration Certificate Rest of World: CISPR 22 Class A Safety IEC 60950 (International) National Deviation per CB Member Countries to IEC 60950 UL 1950 (USA) CSA 22.2, No. 950 (Canada) EN 60950 (Europe)				

* Real-world testing scenarios with zero session loss

** Real-world testing scenarios

Ordering Information

For further information, contact your local Nortel representative.

Nortel Secure Network Access Portfolio



Nortel Secure Network Access (SNA) portfolio offers products for an endpoint security and policy-compliance solution, which is designed to inspect, assess, maximize compliance to policy, and remediate at the network endpoint source, prior to network access. Nortel SNA portfolio products dramatically simplify the complexity of enterprise network access architectures with a constant, open solution that guarantees endpoint security with seamless device quarantine and containment, remediation and repair for LAN users and remote users (IPSec and SSL), with both fixed and mobile connectivity devices. The Nortel SNA solution delivers endpoint security by enabling only trusted, role-based access privileges premised on the security level of the device, user identity, and session context.

Running Nortel SNA with Nortel VPN gateways, routers, and Ethernet switches enables a highly integrated endpoint security solution from a management and ease-of-use perspective. With Nortel SNA, the enterprise can define, deploy, and enforce a robust and consistent security policy across its varied network segments with trusted role-based access premised on user identity and session context. Nortel SNA can ensure that devices meet the corporate security policy before the devices are granted network access to reduce the risk of virus infections, or before misconfigured systems are added to the network. Verifying compliance and blocking connections from noncompliant systems can guarantee 100 percent compliance with corporate policy 100 percent of the time.

Deployment of the Nortel Secure Network Access solution solves the following application requirements:

- **Endpoint Security and Policy Compliance for the Enterprise LAN**

Nortel SNA for the enterprise LAN extends endpoint security: threat mitigation and policy compliance to secure the enterprise LAN infrastructure. Because so many threats are from internal users on the network, endpoint security must include wired and wireless endpoints within the corporate network. The Nortel Secure Network Access Switch (SNAS) is the intelligent policy engine that applies and enforces security policy to any or all LAN users and devices at the point of network access. The SNAS provides a set of capabilities to help customers protect their networks by inspecting the state of PC health, restricting network access for unhealthy clients, and updating unhealthy clients for full, role-based network access, thereby ensuring LAN network integrity. The Nortel SNA LAN solution provides all key security features like authentication, authorization, integrity checking, and containment of unauthorized or infected network resources.

- **Endpoint Security and Policy Compliance for Remote VPNs**

SNA enforces endpoint security for remote VPN users. Nortel SNA enables network administrators to define security policy on the VPN devices itself—VPN Routers and Gateways—and ensures that all users or devices that connect to the VPN gateway devices are inspected for compliance to the enterprise security policy. The Nortel Tunnel Guard checks the security status of an endpoint device, including the status of executables, software versions, and the operating system, before accepting or rejecting the endpoint VPN connection to the corporate network. Nortel VPN Tunnel Guard helps to prevent the end-user PC from becoming a vehicle for viruses or other unwanted intrusions into the secure enterprise network through the VPN tunnel, thereby providing a comprehensive security solution capable of enforcing security best practices on both managed and unmanaged (IPSec and SSL VPN) endpoints.

The Nortel Secure Access Switch 4050 is the first product introduced in the Secure Network access portfolio.

Secure Network Access Switch 4050

Overview

The Nortel SNAS, which is the critical component of the Nortel SNA solution, is the intelligent policy engine that resides in the network and proactively prevents attacks on the enterprise LAN. The Nortel SNAS checks user credentials and host integrity before a client can access the corporate network. The Nortel SNAS also provides seamless quarantining and remediation of the infected resources by providing a mechanism to update a client machine to meet host-integrity policy. When network access is granted, Nortel SNA dynamically assigns clients to VLANs and applies context-based user filters: green VLAN for full network access, yellow VLAN when corrective action is required, and red VLAN when network access is denied.

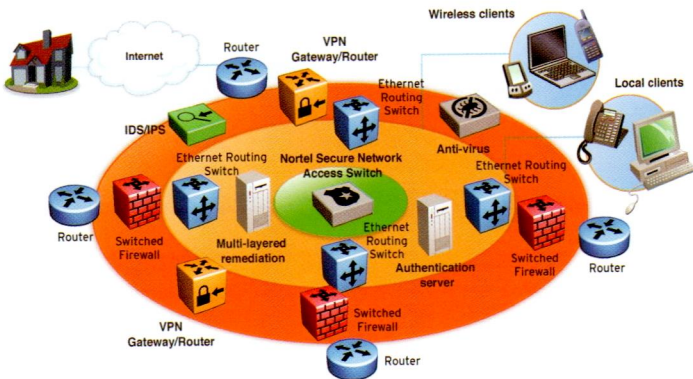
The first release of the Nortel SNAS, the Secure Network Access Switch 4050, delivers a seamless and centralized LAN endpoint security solution with Nortel premier edge switches: the Ethernet Routing Switch 8300 and Ethernet Routing Switch 5500 series.

Deploying the Nortel SNAS with Nortel Ethernet switches, WLAN, and VPN enables a highly integrated endpoint security solution with ease of use and seamless, consistent management. The enterprise can define, deploy, and enforce robust, consistent security policies across the disparate network segments with the policy engine of the Nortel SNAS. All devices that access the enterprise network system can be evaluated, including the operating system, patches, antivirus software, personal firewall status, registry settings, and other system configuration components. By verifying compliance and blocking connections from nontrusted systems with the Nortel SNAS, the enterprise can define and enforce a robust security policy across the network.

Typical Applications

- Remote access
- Policy compliance (for example, Sarbanes-Oxley)
- Guest access to the LAN
- Mobile employee access
- Security within the enterprise LAN

Network Diagram



Features and Benefits

- Dynamic security policy management and enforcement
- Clientless, integrated secure access
- High-performance, availability, and scalability
- Nortel network access security and layered defense
- Low total cost of ownership

Technical Specifications

Nortel Secure Network Access Switch 4050—Release 1.0

Hardware specifications		 Nortel Secure Network Access Switch 4050	
Form factor	1-RU high custom base chassis		
Dimensions (H x W x D)	4.4 cm (1.389 in.) x 42.9 cm (16.9 in.) x 55.9 cm (22 in.)		
Weight	Approximately 11.35 kg (25 lb)		
Rack mountable	Rack-mount hardware to allow mounting in 48.26 cm (19 in.) standard rack	Functional capabilities	
Processor	Intel Pentium 4, 2.8 GHz, 533 MHz from side Bus	Security features	
Memory	(2) GB DDR 200/266 MHz, ECC registered	Authentication • RADIUS, and challenge/response • LDAP, Windows NT Domain • Native Local user database • RSA Secure ID, SC safeword • ActivCard • X 509 digital certificate • Microsoft Active Directory	
On-board LANs	(2) 10/100/1000 Base –TX ports	Authorization • Endpoint security status and access method (Tunnel Guard) • Dual profile authorization • Profile includes network, service, device and application level (Layer 2–7) • Profile extensions include source network, client security and authentication method	
Expansion slots	(2) Full height 64-Bit 133/100/66 MHz PCI-X slots		
PCI card	(1) Intel Dual Port Copper 10/100/1000 Base-TX GB-EIDE PCI card		
Drives	(1) 40 GB or 80 GB IDE Hard Drive, 7200 RPM, ATA 133		
USB port	(2) USB 1.1 ports		
Serial port	(1) Console port, CDE (DB9-F), RS 232-C, 9600 Baud, 8-N-1		
Power Supply	300 Wm 100–240 V ac, 50–60 Hz	Security protocols • SSL • IPSec • TLS RFC2246	Client security • Nortel Tunnel Guard • Dynamic access policies
Temperature	5°C – 35°C (41°F – 95°F)		

Ordering Information

For further information, contact your local Nortel representative.

Nortel VPN Portfolio

Nortel VPN portfolio encompasses next-generation family of products that deliver security and IP services in a single integrated platform. Targeted at the wide-area network (WAN) edge, that being the intersection of an enterprise's private and public IP networks, the Nortel VPN family is optimized to exploit the cost advantages of the Internet while providing secure communications across the public IP infrastructure.

The latest software revision of the Nortel VPN Router, Release 6.0, adds more security, management, and VoIP-compatibility features. These features enhance network operations when the VPN Router is deployed in an end-to-end secure network with voice and data applications.

Products in the Nortel VPN portfolio include:

- Nortel VPN Gateway 3050/3070
- Nortel VPN Router portfolio
 - Nortel VPN Router 221
 - Nortel VPN Router 251
 - Nortel VPN Router 600
 - Nortel VPN Router 1010
 - Nortel VPN Router 1050
 - Nortel VPN Router 1100
 - Nortel VPN Router 1750
 - Nortel VPN Router 2700
 - Nortel VPN Router 5000

Nortel VPN Gateway 3050 and 3070



Overview

The Nortel VPN Gateway portfolio includes secure access solutions that extend enterprise applications and resources beyond the boundaries of traditional VPNs to remote employees, partners, and customers. The solutions deliver high reliability and cost savings, as well a single point of authentication that administrators appreciate. Various-sized organizations benefit from remote access options, encryption, and deployment choices. Nortel VPN Gateways capitalize on the native capability of widely deployed Web browsers and SSL VPN while supporting traditional IPSec-based VPN clients. The Nortel VPN Gateways and SSL VPN functionality offer the most convenient, flexible, and cost-effective secure access solution on the market.

Nortel's SSL VPN technology offers true freedom of mobility to a broad range of applications by giving remote user (employees, partners, and customers) more opportunities to communicate securely and to share information on-demand. Users are assured consistent, secure access to voice, data, or multimedia applications (SIP, Video, IM, and more) from their personal laptop computers, a PC at a customer's site, a Web browser-equipped Personal Digital Assistant (PDA) or smart phone, or an Internet terminal in a public location.

Nortel VPN Gateways perform content transformation while the application runs to convert instantly most intranet resources into secure Web pages on the Internet. The VPN Gateways employ an advanced network address and port translation (NAPT) utility to build SSL-secured VPN tunnels for client/server communications from Web browser-equipped user devices without installing a VPN tunnel client.

Organizations can deploy a Nortel VPN Gateway quickly at existing Internet connection points. The VPN Gateway has few network prerequisites for seamless deployment into existing networks. A Nortel VPN Gateway provides enterprises with a clientless alternative to securely provision resources to remote users, without installing and managing VPN tunnel client software on their PCs.

Ideal For

The Nortel VPN Gateway is ideal for:

- Large enterprises that need to provision remote access services to a high number of teleworkers, mobile employees, partners, and customers.
- Any organization that wants to extend the reach of its enterprise portal (for example, IBM Websphere, SAP, Plumtree, BEA, and PeopleSoft) beyond the traditional LAN/WAN.
- Small- and mid-sized organizations that want to invest in a flexible remote access solution that can grow with their businesses.

Business Challenges

The business challenges to consider when

deciding to purchase a Nortel VPN Gateway are:

- Are you challenged with managing VPN client software on users' PCs?
- Do you wrestle with adapting secure remote access to mobile and wireless infrastructures?
- Do you have trouble supporting mobile users located on unknown networks?
- Do you experience many help desk calls from remote access users?
- Does your current LAN, WAN, or RAS architecture offer limited user mobility?
- Do you want to provision instantly secure connections to partners without constraining prerequisites?

Typical Applications

The Nortel VPN Gateway can be deployed to solve a number of applications.

- **Enterprise extranets**

Integrating business partners with existing production systems can streamline supply chains and reduce inventory and production cycles. Nortel provides business partners with a simple, secure connection to a particular production application or enterprise portal. Not deploying VPN software on partner PCs can eliminate deploying a dedicated VPN router at the partner's site.

- **Mobile employee access**

Mobile employees require access to a broad range of applications. Primary applications include e-mail, scheduling, file transfer, a Customer Relationship Management (CRM) application, or a Sales Force Automation (SFA) application. Nortel VPN Gateways give true freedom of mobility and more opportunities to communicate and share information with mobile workers. Mobile employees access applications from a portable laptop computer, a PC at a customer site, a Web browser-equipped PDA, or any available Internet terminal at hotels, airports, or convention centers.

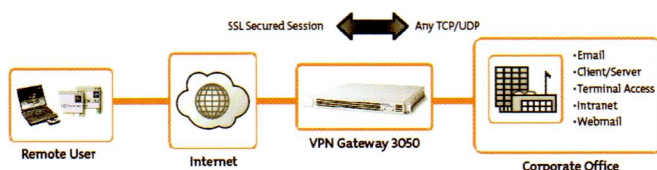


Figure 1: Nortel VPN Gateway for Remote Access

- **External intranet applications**

Nortel VPN Gateways allow enterprises to dynamically redirect intranet Web pages and internal portal resources, which are available on the Internet, through the VPN Gateway using HyperText Transport Protocol Secure (HTTPS). Enterprises can create instant extranet access to applications and resources without deploying SSL capabilities on each application or portal server. Administrators can avoid rewriting internal pages and links for resources that they wish to make accessible to external users.

- **Secure Sockets Layer (SSL) acceleration**

Enterprises can deploy Nortel VPN Gateways as dedicated SSL acceleration-only appliances that offloads computational intensive SSL processing from web servers. Offloading this function to a Nortel VPN Gateway can yield a 5 to 50 times server performance improvement over nonaccelerated HTTPS servers, optimizing the Web server to perform its primary function. Decrypting server-side traffic from Nortel VPN Gateways ensure application switches can regain packet visibility necessary for network services and Layers 4 through 7, such as load balancing, content-intelligent switching, and session persistence.

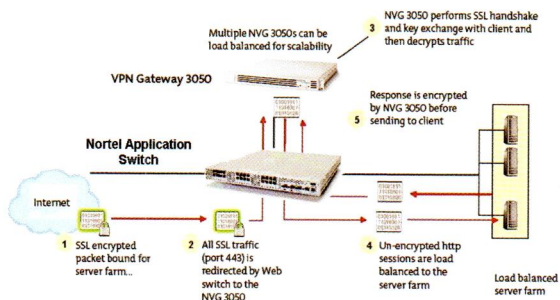


Figure 2: Nortel VPN Gateway for SSL Offload and Acceleration

• Security within the enterprise perimeter

Not all applications on a corporate network require the same level of security. Subscription or license-based databases have strict access constraints, departmental applications contain sensitive information, human resources applications provide confidential personal data, and financial systems require restricted access. These applications, among many others, warrant additional security within the corporate network. Nortel VPN Gateways can provide application-specific authentication for internal access control and client-to-application encryption within the private network for confidentiality and privacy to wired and wireless users.

Key Points

The key points of the Nortel VPN Gateway include:

- high performance, availability and scalability
- the most flexible secure remote access gateway available
- supports multiple modes of SSL operation including clientless, enhanced clientless and transparent (client-based)
- low cost and simplified management mitigate the need to install and support VPN clients
- improved reliability and user mobility allow secure access from browser-equipped (SSL) devices
- available as an upgrade on many Nortel products

Features and Benefits

The features and benefits of the Nortel VPN Gateway include:

- Easy access: the VPN Gateways remove the ongoing client support and maintenance requirements associated with traditional remote access solutions.
- Deployment flexibility and investment protection: supports multiple SSL VPN access modes (browser only, Java applet, or full SSL VPN access through Net Direct) and can terminate the VPN client.
- High scalability, availability, and performance: supports thousands of concurrent SSL and IPSec VPN user tunnels and provides hundreds Mb/s of aggregate VPN throughput. Gateways provide VPN acceleration, load balancing and can be clustered in groups of up to 32 units to support highly vigorous VPN designs.
- Strong remote endpoint security: Nortel VPN Gateways provide a suite of safeguard features to protect against malicious intent and user negligence. The VPN Gateways support the Nortel VPN Tunnel Guard feature, which enforces endpoint security checking for both client and client-less VPN endpoints.

Nortel SSL VPN is available on several Nortel security and VPN platforms:

- Nortel Application Switch 2424-SSL
- Nortel VPN Router Portfolio (1740, 2700, and 5000)

- A tiered licensing model of 50, 100, 250, 500, and 1000 user license levels provides flexible and scalable deployment options.

Market Information

The emergence of SSL VPN as a secure and highly flexible way to provide secure access to enterprise resources changes the traditional enterprise remote access VPN landscape. The ability to provide a customized and dynamic Web portal front-end for users without deploying and configuring a traditional VPN client to either managed (employee) or unmanaged (partners) users and devices is a compelling value proposition for a wide enterprise audience.

The SSL VPN market is the fastest growing security segment and is expected to reach more than \$600 million by 2006. Leading industry analysts enthusiastically endorse the technology for remote access, citing benefits of simplicity, mobility, and cost savings of up to 50 percent versus alternative remote access solutions.

Nortel VPN portfolio (made up of VPN Gateways and Routers) offers true freedom of mobility to a broad range of applications by giving mobile workers opportunities to communicate securely and share information. Workers are assured consistent, secure access to voice, data, and multimedia applications (SIP, video, Instant Messaging, and more) from a portable laptop computer, a PC at a customer site, Web-browser equipped PDA or any available Internet terminal at hotels, airports, or

convention centers. Nortel VPN portfolio also enforces endpoint security checking for all types of endpoints to make sure that remote users or devices do not become a vehicle for viruses or other unwanted intrusions into the secure enterprise network through the VPN tunnel.

The Nortel SSL VPN solution is optimized for VoIP, which means that the Nortel Net Direct capability invokes a technology called Fast Path that optimizes the connection when VoIP and SIP need QoS. Nortel customers do not pay a "voice quality price" when they deploy SSL VPN security, as proven by tests performed by the Tolly Group (www.nortel.com/corporate/events/2005b/tolly_eseminar/index.html)

Nortel demonstrates leading performance among SSL VPN competitors in third-party testing (Light Reading). The Gartner Group and Forrester Research recognize Nortel an industry leader in their published SSL VPN reports. Nortel VPN or security-related recognition:

- Infonetic V N market share leadership—number two in 2004
- Gartner Group Magic Quadrant Leaders for both IPsec and SSL VPN
- Forrester Research Leader's Category for SSL VPN
- Network Computing "Tester's Choice" award for IPsec VPN
- Network Computing's Well-Connected Award for Security and IPsec VPN
- ICSA, VPNC, and NIST VPN and Security certifications

Technical Specifications

Hardware specifications	VPN Gateway 3050	VPN Gateway 3070
Maximum concurrent VPN session	2000	5000
Deployment positioning	Medium to large enterprise	Large enterprise and VPN service providers
CPU	(1) Intel P4 2.4 GHz	(2) Intel Xeon 2.8 GHz
Memory	1 GB DDR 266 MHz	2 GB DDR 266 MHz
On-board LANs	(2) 10/100/1000-Tx	(2) 10/100/1000-Tx
Expansion	(1) dual 10/100/1000-Tx	(1) dual 10/100/1000-Tx or -FX (fiber)
Drives	(1) 40GB IDE (1) CD-ROM	(1) 80GB IDE (1) CD-ROM
Functional capabilities	Security Features: Authentication • RADIUS and challenge and response • LDAP, Windows NT Domain • Native local user database • SC SafeWord, RSA SecurID • ActivCard • Novell NDS and e-Directory • Netegrity SiteMinder • X.509 digital certificate • Microsoft Active Directory Single Sign-on (SSO) • WFS, Web applications HTTP, form-based authentication • HTTP headers • SSO with Netegrity SiteMinder • Domain- and network-specific sign-on SSO Authorization • Dual-profile authorization • Base profile includes network, service, and application level information (Layers 3, 4 through 7) • Extended profile adds source network, client security, and authentication method • Endpoint security status and access method (Tunnel Guard, IPSec, and SSL) Security protocols • SSL v2.0, 3.0 • TLS 1.0 (RFC 2246) • IPSec ESP, AH Cipher suites • All ciphers covered by SSLv2.0, 3.0 and TLSv1.0 except the IDEA ciphers and the FORTEZZA ciphers accounting • Syslog/RADIUS account start and stop including user name, gateway address, session ID, session time, and cause of termination Client security • Nortel VPN Tunnel Guard • Automatic log off with countdown • Rewriting to no-cache and no-store headers • Cache cleansing of files and history • Dynamic access policies	

Nortel VPN Client Support	• Split Tunneling • VPN Tunnel Guard (for IPSec and SSL) • Nortel VPN Client Mobility • Portal full-access tab • Certificate-based authentication • Support for PDAs and smart phones
VPN high availability	Load Balancing • IPSec/SSL service Load Balancing using clustering • Load Balancing of back-end services to include Source IP and round robin Session persistence • Source IP, SSL session ID, cookie information Application health checking • SSL w/TCP/IP/Port • Scriptable, configurable intervals • Performance Managed service features • Support for 250 VPN domains per Gateway • VPN binding with 802.1q • Authentication and DNS mapping • Split administration • License pooling • Clustering support for up to 255 VPN Gateways

Application support	• Access to Web-based, client/server and native terminal server applications • Network-layer native desktop application access using SSL or IPsec mode Web content and protocols • HTML/DHTML • JavaScript/Java Applets/XML • HTTP/HTTPS • VBScript File share protocols • Windows—SMB/CIFS • Generic—FTP E-mail and messaging protocols • Microsoft Exchange (MAPI) • IBM/Lotus Domino/Notes • IMAP, SMTP, and POP3 Terminal access protocols • Telnet • SSH Remote desktop protocols • Citrix ICA • Microsoft WTS (RDP) Management • Secure administrative Web GUI (HTTPS) • Serial port to CLI • Local logging, external Syslog • SNMP v2 and v3 • RFC 1213 MIB for Management of TCP/IP-based internets • RFC 2737 MIB entPhysicalTable • RFC 2863 Interfaces Group MIB • RFC 3418 SNMP MIB • RFC 2574 user-based security model (USM) for SNMPv3 • RFC 2575 view-based access control model (VACM) SNMP Web portal customization • Hexadecimal color customizable • Company logo (.gif), text • Novice, intermediate and advanced user views • Portal pass-through Browser support • Windows (98, 2000, XP) • Internet Explorer 5 or better with Sun Microsystems JRE 1.3 or better • Internet Explorer 5 or better with Microsoft JVM 4 or better • UNIX • Netscape Navigator 7 with Sun Microsystems JRE 1.3 or better • Mozilla 1.3 or better with Sun Microsystems JRE 1.3 or better Modes of operation • Clientless—HTML to browser • Enhanced Clientless—Proxy with Java Applet • Full Network Extension—SSL Client (Net Direct) delivered by download or Nortel VPN Client access Licensable options • IPsec and SSL VPN users • Secure Services Provisioning • Portal Guard
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Ordering Information

For further information, contact your local Nortel representative.

Nortel VPN Router Portfolio

Overview

The Nortel VPN Router portfolio provides routing, IPSec, SSL VPN, firewall, bandwidth management, encryption, authentication, and data integrity for secure connectivity across managed IP networks and the Internet. From a small branch site to a large network environment, Nortel VPN Routers provide cost and performance advantages, security, and control. In addition, the portfolio provides best-in-class features and benefits, flexibility, scalability, and cost savings. With the Nortel VPN Router portfolio, enterprises achieve anytime, anywhere remote access and site-to-site VPNs.

With secure routing technology (SRT) built into their DNA, Nortel VPN Routers are the next generation family of products to deliver security and IP services in a single integrated platform. Designed for the enterprise edge, the intersection of enterprise private and public IP networks, the VPN Router portfolio capitalizes on the cost advantages of the Internet while providing secure communications across the public infrastructure. As a scalable family of devices, the Nortel VPN Router portfolios offer an IP services portfolio, from the low-end Nortel VPN Router 200 series to the high-end Nortel VPN Router 5000, to meet specific enterprise network requirements. The Nortel VPN Router portfolio can address the smallest branch site and the largest headquarters environment. With a comprehensive set of software-based IP services, enterprises can deploy services by activating software license keys as needed to save costly hardware upgrades or network downtime. Each Nortel VPN Router can be purchased and installed as an IP access router, an IP VPN gateway, or a stateful firewall device depending on needs and budget. The range of LAN and WAN interfaces of the VPN Router makes it an easy fit into existing enterprise networks. Similarly, service providers can deliver new revenue-generating IP and security services without disrupting existing customer-based or carrier infrastructures.

The Nortel VPN Router portfolio includes the Nortel VPN Routers Release 6.00, which adds security, management, and other services and features to the VPN Router portfolio. These services and features build on the Nortel VPN Router product line for an end-to-end secure network for deploying voice and data applications.

Ideal For

The Nortel VPN Router portfolio is ideal for:

- enterprises building secure, scalable, resilient, high-performance virtual private networks (VPNs)
- secure mobile converged solutions for anytime, anywhere remote access VPNs and site-to-site VPNs, intranets, and extranets

Business Challenges

- Do you want to capitalize on the Internet or a managed IP transport service to reduce telecommunications backbone costs? Nortel VPN Routers enable organizations to use the Internet or a managed IP service for secure mobile remote access and site-to-site

connectivity; intranet and extranet connections cost less than competing technologies such as frame relay or leased lines.

- Is network security important to your organization? The Nortel VPN Router Portfolio integrates all of the necessary VPN technologies into a single platform: routing, firewall, bandwidth management, encryption, authentication and data integrity for secure tunneling across the Internet.
- Do you want to lower your total cost of ownership? The Nortel VPN Routers lowers capital and operational expenses and yet guarantees the most secure, resilient network connectivity.

Typical Applications

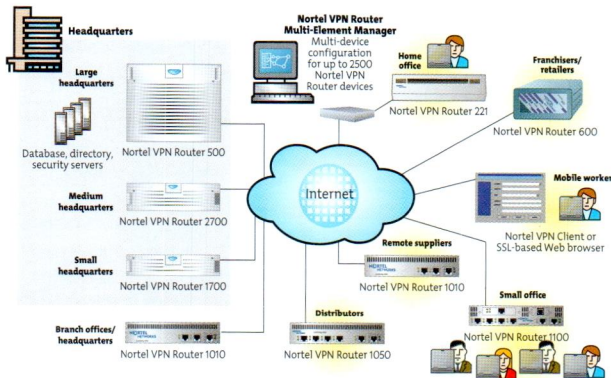
Nortel offers a complete VPN solution with the Nortel VPN Router portfolio. These high-performance VPN platforms provide user access to the enterprise network at anytime and from anywhere through a secure virtual private network. IP-VPNs, created using Nortel VPN Routers, provide connections to employees, customers, suppliers, partners, and organizations to foster communication and collaboration and to guarantee secure network connectivity at the lowest possible cost of ownership.

The Nortel VPN Router portfolio integrates the necessary VPN technologies into a single platform; the platform includes routing, firewall, bandwidth management, encryption, authentication, and data integrity for secured tunneling across the Internet. The integration of

multiple IP services into a single platform helps to ensure the highest levels of security and the lowest total cost of ownership.

Typical VPN applications include remote access, teleworking, access for workers on-the-road, and browser-based SSL VPN applications. The Nortel VPN Router portfolio also delivers best-in-class site-to-site VPNs, corporate intranets, SOHO, and small, medium, and large enterprise branch sites in local, regional, national, and global network configurations. The site-to-site solution includes site-to-site encrypted tunneling; IPSec encryption from the switch to the desktop; integrated configuration and management software; simplified interfaces for both switch administration and for the IPSec client; and integrated authorization, authentication, and accounting (AAA) server and flexible, scalable VPN deployment options.

Network Diagram



Key Points

The key points of the Nortel VPN Router portfolio are as follows:

- Security is built into the Nortel VPN Router portfolio DNA with secure routing technology (SRT) framework. Nortel VPN Router portfolio devices provide secure data transmission, of data, and the inherent security of the device

and its management.

- A single integrated hardware device provides routing, firewall, bandwidth management, encryption, authentication, and data integrity for secure tunneling across managed IP networks and the Internet. One router provides a full range of features for building high-performance, scalable, secure IP-VPNs.
- Mix-and-match IP services capability includes

advanced routing, full VPN capabilities, and stateful firewall. Organizations buy and set up services independently and activate the software license keys as the organization needs to add the services.

- Integrated SSL and IPSec VPN capability in the Nortel VPN Router platform, enabled with the Nortel SSL VPN Module 1000 PCI option card available with Nortel VPN Router Server release 6.0, ensures secure, anywhere, anytime ubiquitous access regardless of access technology.
- With standards-based IP routing services, a Nortel VPN Router can integrate into an existing router network, or it can operate independently as a highly redundant, flexible, secure network.
- Cost savings occur by using the Internet or a managed IP service as the wide-area transport, which allows connections to be local to users. The Nortel VPN Routers SRT guarantees low CAPEX and OPEX for enterprise VPN deployments.
- This highly scalable portfolio ranges from the low-end Nortel VPN Router 200 Series (Nortel VPN Routers 221 and 251) to the high-end Nortel VPN Router 5000. Nortel VPN Router platforms can address the smallest of branch site or the largest headquarters environment. Nortel VPN Routers also make it easy to scale the network to allow for fully meshed network connectivity.
- Nortel VPN Router Server Release 6.0 introduces support of advanced encryption standard (AES) for branch office tunnels.
- Nortel VPN Routers also builds on the service provider backbone for a consistent level of performance and service level agreements (SLA). Additional provider services can be available.

Features and Benefits

- **Best-in-class virtual private networking (VPN):** as a market leader in IP virtual private networking (IP-VPN), Nortel VPN Router portfolio has delivered secure end-to-end IP-VPNs for years. IP-VPN capabilities are standard in every Nortel VPN Router unit, with all base configurations shipping

with a minimum of five VPN tunnels.

All Nortel VPN Routers include the following VPN capabilities:

- Standards-based tunneling provides support for IPSec, L2TP, PPTP, and L2F standard tunneling protocols delivers interoperability with a wide range of multivendor VPN software and hardware.
- Encryption support for DES, 3DES and advanced encryption standard (AES) provides ultimate end-to-end security for transmitted data.
- Authentication support for RADIUS, LDAP, SecureID, X.509 digital certificates, as well as token and smart cards, offers the broadest range of authentication options in the industry.
- Comprehensive VPN client support of the Nortel VPN client software for MS Windows systems, including Windows 2000, NT, Millennium and XP is provided free of charge with every Nortel VPN Router unit. Nortel VPN clients are available for UNIX and Macintosh operating systems. Secure access from wireless and hand-held devices is additionally supported via third-party IPSec clients.
- **SSL VPN Module 1000:** offers fully featured third-generation Secure Sockets Layers (SSL) VPN services on Nortel VPN Routers. Available as an option on the Nortel VPN Router 1750, 2700, and 5000 models, the SSL VPN module delivers new tightly-integrated SSL/IPSec services to enterprises, while enabling Nortel VPN Router customers to incrementally add SSL remote access into their existing Nortel VPN Router devices. Secured Sockets Layer (SSL) is a convenient secure remote access alternative to IPSec that builds on the native capabilities of widely deployed Web browsers and avoids the need to install and administer client tunnel software on remote PCs. The SSL VPN Module 1000 incorporates dedicated SSL processor, memory and accelerator hardware to deliver uncompromising levels of performance and scalability without adversely impacting other key functions on the Nortel VPN Router

platform. SSL services can take advantage of common user profiles, authentication techniques, and management already in place for IPSec users to minimize administrative overhead. An integrated Universal Access Portal further simplifies the VPN user experience by transparently invoking the most appropriate VPN access (IPSec or SSL) based on the user's access needs.

- **VPN Client:** provides user-side (client) functionality for secure remote access over IP networks using Nortel VPN routers and VPN servers. Nortel VPN Client software works on almost all user workstation platforms, including Windows, 2000, NT, Me, XP, Handhelds (Pocket PC through Palm), IBM-AIX, HP-UX, SUN-Solaris, Linux, and Macintosh operating systems.
 - Enables enterprises to establish and enforce centralized security policies to extend remote access without exposing the internal network to unauthorized use.
 - Eliminates the need to distribute and install client software on all access devices because the client can silently self-install when a session is activated.
 - Fits easily into the typical multivendor access network, where end user devices are likely to span multiple operating systems, access speeds, and platform types.
 - Allows end-users to roam across network boundaries (for example, from wireless LAN to fixed LAN) without breaking the secure VPN connection and disrupting end-user applications.
 - Optimizes the user experience through load-balancing to eliminate bottlenecks and overload conditions, failover to route around network trouble spots, and data compression to conserve transmission bandwidth and time.
 - Offers ease of use to end users through one-click tunnel connection, Microsoft dialer, split tunneling, and custom banners or icons.
- **Stateful firewall:** combines an easy-to-use interface with rich filtering rule sets to provide multiple lines of defense for a private network. With extensive logging, a wide range of application layer gateways (ALG), and built-in

protection against hacker attacks, the stateful firewall delivers wire-speed throughput while protecting the enterprise network and its data from unauthorized access. The firewall can combine with VPN termination and network address translation (NAT) services to flexibly apply filtering policies to data sent across either tunneled or nontunneled interfaces.

- **Secure, standards-based routing services:** enable Nortel VPN Routers to integrate into an existing router network or to operate on its own to build a highly redundant and flexible secure network. With support for open shortest path first (OSPF), routing information protocol (RIPv1 and v2), and virtual route redundancy protocol (VRRP), Nortel VPN Routers can dynamically route traffic around failed connections or devices, as well as load balance traffic across parallel paths - whether for tunneled or nontunneled traffic. Secure routing technology on the Nortel VPN Routers eliminates complex encapsulation protocols and corresponding overhead when forwarding IP traffic through secure IP VPN tunnels.
- **Bandwidth management and quality of service:** with advanced services provide differentiated services (DiffServ), RSVP, and sophisticated queue management can ensure that service levels are met for any mission-critical data. The Nortel VPN Router portfolio can prioritize traffic not only by IP traffic type, but also by users, groups and VPN tunnels, allowing fine granularity in QoS control.
- **LAN and WAN flexibility:** with integrated support for 10/100 Mb/s Ethernet, frame relay, PPP, T1/E1 CSU/DSU, HSSI, V.35, X.21, ADSL, and V.90 modem interfaces, Nortel VPN Routers offer great flexibility for placement within the enterprise network. The Nortel VPN Routers can act as the primary WAN/Internet access device using frame relay, dial-up or leased line connection, or be connected to an existing WAN or Internet access device through a standard Ethernet interface. With dial back-up, traffic passes through an alternative connection if the primary WAN or LAN link fails.
- **Comprehensive management services:** provide provisioning capabilities through the

Nortel VPN Router Multi-Element Manager, an intuitive, graphical configuration tool that streamlines the process of provisioning Nortel VPN devices, including routing, VPN, firewall, QoS, and policy services across headquarters, branch, and remote sites. Two licensing options are available: one to support as many as 250 Nortel VPN Routers; and one for as many as 2500 Nortel VPN Routers.

- Remote management options permit provisioning of Nortel VPN Routers from a

data center or network operations center (NOC).

- Quick-start utility guides the nontechnical user through the initial configuration process, to eliminate the need for an on-site installer.
- Fault management using SNMP, alarm monitor, and a historical fault browser quickly detects problems.
- Administrators track all transactions and events using a rich set of security and system logging tools.

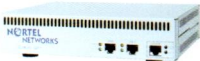
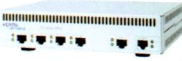
Note: For more details, see the Nortel Network Management section in this guide.

Market Information

Company	Products	Comment
Nortel	Nortel VPN Router Series 221, 251, 600, 1010, 1050, 1100, 1700, 1750, 2700, 5000	The most complete VPN solution, tightly integrated VPN encryption, stateful firewall and routing functions in one purpose-built platform; from branch office to central site in one product line; no mixing and matching; high-performance.
Cisco (Altiga)	VPN Concentrators: VPN 3000 Series 3002, 3005, 3015, 3030, 3060, 3080	Currently does not integrate into the Cisco secure policy manager framework. Primary role on remote access VPN solution only; not positioned as a branch VPN solution; no stateful firewall; no WAN option; no CLI.
Cisco (Routers)	IPSec VPN Enabled Routers 800/900, 1700, 2600, 3700 and 7100/7200 series	IOS-based routers were designed for open clear text Internet connectivity. They must be hardened from a security perspective by users to meet a basic level of security. Enterprises are forced to spend time, effort and money to research router vulnerabilities in an effort to harden the router with hardware encryption. IOS routers have limited firewalls, limited client based on IRE/Safenet, no internal databases like RADIUS or LDAP for authentication, authorization and accounting.
NetScreen	VPN Gateway/Firewall Netscreen 5XP, 5XT, 25, 50, 200, 500, 1000 and 5000	Good performance but limited remote client. Additional purchase of user-based client licenses is required. Netscreen relies on external RADIUS servers for authentication with limited ability to compress traffic for either branch or client.
Nokia	VPN/Firewall Appliances IP Series 30, 120, 330, 350, 380, 530, 650, 710, 740	Solution-based on Check Point VPN-1/FW-1 software; limited feature client; limited VPN throughput. Separate Nokia management is required for hardware platform.
Nokia	VPN Gateways CryptoCluster Series CC500, 2500, 5200	VPN clustering solution is based on Network Alchemy product acquisition; no integrated firewall option; no WAN option; Nokia-developed client option.
SonicWall	VPN Gateways/Firewalls: SOHO2, Tele2, XPRS2, PRO, PRO-VX	Slow performance numbers; no L2TP; VPN is upgrade on SOHO2, XPRS2; no QoS/bandwidth management; limited RAS client; not a large enterprise grade solution; however performance can be enhanced with Probos accelerator equipment.

Technical Specifications

Nortel VPN Router 221 (Up to 5 user or branch tunnels) Processor/memory • 166 MHz ARM processor • 4 MB Flash — 16 MB RAM Max 3DES throughput • 5 Mb/s Standard equipment • 10/100 Mb/s Ethernet • 4 port switch — autosensing 10/100 Base-T • Console Port (RS-232, DB-9f) Standard software • Nortel VPN Router 221/251 O/S with 5 VPN tunnels and IP routing Physical dimensions Length: 18.8 cm (7.4 in.) Width: 12.7 cm (5 in.) Height: 35.6 cm (1.4 in.) Weight: 310 g (10.9 oz)	Nortel VPN Router 251 (Up to 5 user or branch tunnels) Processor/memory • 166 MHz ARM processor • 4 MB Flash — 15 MB RAM Max 3DES throughput • 5 Mb/s Standard equipment • 4 port switch — autosensing 10/100 Base-T • ADSL — G.992.1, Annex A, Annex B or UR-2 • Console Port (RS-232, DB-9f) Standard software • Nortel VPN Router 221/251 O/S with 5 VPN tunnels and IP routing Physical dimensions Length: 23.11 cm (9.1 in.) Width: 16 cm (6.3 in.) Height: 53.4 cm (2.1 in.) Weight: 468 g (16.6 oz)	Nortel VPN Router 600 (Up to 50 user or branch tunnels) Memory • 128 MB memory Processor • 300 MHz Celeron processor Expansion slots • One PCI Expansion Slot Max 3DES throughput • 20 Mb/s Standard equipment • 2 x 10/100 Base-T Ethernet ports • Management/console port (DB-9) Standard software • Nortel VPN Router O/S with 50 VPN tunnels and IP routing LAN/WAN options • Additional 10/100 Base-T Ethernet • T1/E1 with CSU/DSU • V.90 Dial Modem • ISDN BRI (S/T and U Interfaces) • ADSL • V.35/X.21/RS-232 Serial • 56/64 K CSU/DSU Physical dimensions Length: 27.9 cm (11 in.) Width: 21.6 cm (8.5 in.) Height: 10.2 cm (4.0 in.) Weight: 2.9 kg (6.0 lb) Operating environment Electrical: 90-264 V ac, 50-60 Hz Temperature: 0° to 55°C (32° to 131°F) Relative Humidity: 5-85% non condensing
		

Nortel VPN Router 1010 (Up to 30 user/branch tunnels)	Nortel VPN Router 1050 (Up to 30 user/branch tunnels)	Nortel VPN Router 1100 (Up to 30 user/branch tunnels)
Memory • 128 MB memory; 64 MB Flash Processor • 300 MHz Celeron processor Max 3DES throughput • 20 Mb/s Standard equipment • 2 x 10/100 Base-T Ethernet ports • Management/console port (DB-9) Standard software • Nortel VPN Router O/S with 5 VPN tunnels and IP routing Physical dimensions Length: 20.3 cm (8 in.) Width: 21.6 cm (8.5 in.) Height: 4.4 cm (1.75 in.) Weight: 1.2 kg (2.7 lb) Operating environment Electrical: 100–264 V ac, 50–60 Hz Temperature: 0° to 40°C (32° to 104°F) Relative Humidity: 10–90% noncondensing	Memory • 128 MB memory; 64 MB Flash Processor • 300 MHz Celeron processor Max 3DES throughput • 20 Mb/s Standard equipment • 2 x 10/100 Base-T Ethernet ports • 4-port 10/100 Ethernet switch • Management/console port (DB-9) Standard software • Nortel VPN Router O/S with 5 VPN tunnels and IP routing Physical dimensions Length: 20.3 cm (8 in.) Width: 21.6 cm (8.5 in.) Height: 4.4 cm (1.75 in.) Weight: 1.2 kg (2.7 lb) Operating environment Electrical: 100–264 V ac, 50–60 Hz Temperature: 0° to 40°C (32° to 104°F) Relative Humidity: 10–90% noncondensing	Memory • 128 MB memory; 64 MB Flash Processor • 300 MHz Celeron processor Expansion slots • Two PCI Expansion Slots Max 3DES throughput • 20 Mb/s Standard equipment • 2 x 10/100 Base-T Ethernet ports • 4-port 10/100 Ethernet switch • Management/console port (DB-9) Standard software • Nortel VPN Router O/S with 5 VPN tunnels and IP routing LAN/WAN options • Additional 10/100 Base-T Ethernet • T1/E1 with CSU/DSU • V.90 Dial Modem • ISDN BRI (S/T and U Interfaces) • ADSL • V.35/X.21/RS-232 Serial • 56/64K CSU/DSU Physical dimensions Length: 26.9 cm (10.5 in.) Width: 21.6 cm (8.5 in.) Height: 4.4 cm (1.75 in.) Weight: 1.7 kg (3.8 lb) Operating environment Electrical: 100–264 V ac, 50–60 Hz Temperature: 0° to 40°C (32° to 104°F) Relative Humidity: 10–90% noncondensing
		

Nortel VPN Router 1750 (5 to 500 user or branch tunnels)	Nortel VPN Router 2700 (Up to 2000 user or branch tunnels)	Nortel VPN Router 5000 (Up to 5000 user or branch tunnels)
Memory • 128 MB memory standard • 256 MB memory maximum Processor • Intel Pentium III Expansion slots • Four expansion slots Max 3DES throughput • 125 Mb/s Standard equipment • 2 x 10/100 Base-T Ethernet ports • Management/console port (DB-9) Standard software • Nortel VPN Router O/S with 50 VPN tunnels and IP routing (Secure Router bundle) • Nortel VPN Router O/S with 500 VPN tunnels and IP routing (VPN bundle) LAN/WAN options • Additional 10/100 Base-T Ethernet • 1000BaseSX/T Gigabit Ethernet • 1 port T1/E1 with CSU/DSU • 4 port T1/E1 with CSU/DSU • V.90 Dial Modem • ISDN BRI (S/T and U Interfaces) • ADSL • V.35/X.21/RS-232 Serial • 56/64K CSU/DSU • High-Speed Serial Interface (HSSI) Physical dimensions Length: 53.3 cm (21 in.) Width: 43.8 cm (17.25 in.) Height: 13.3 cm (5.25 in.) Weight: 12.7 kg (28.0 lb) Operating environment Electrical: 90–264 V ac, 2.0A @ 90 V ac, 47–63 Hz Temperature: 0° to 40°C (32° to 104°F) Relative Humidity: 10–90% noncondensing	Memory • 256 MB memory Standard • 512 MB Maximum Processor • 1.33 GHz Pentium III Expansion slots • Three PCI expansion slots Max 3DES throughput • 200 Mb/s Standard equipment • 2 x 10/100 Base-T Ethernet ports • Management/console port (DB-9) Standard software • Nortel VPN Router O/S with 5 VPN tunnels and IP routing (Secure Router bundle) • Nortel VPN Router O/S with 2000 VPN tunnels and IP routing (VPN bundle) LAN/WAN options • Additional 10/100 Base-T Ethernet • 1000 BaseSX/T Gigabit Ethernet • 1-port T1/E1 with CSU/DSU • 4-port T1/E1 with CSU/DSU • V.90 Dial Modem • ISDN BRI (S/T and U Interfaces) • ADSL • V.35/X.21/RS-232 Serial • 56/64K CSU/DSU • High-Speed Serial Interface (HSSI) Other hardware options • SSL VPN Module • Encryption Accelerator Card Physical dimensions Length: 53.3 cm (21 in.) Width: 43.8 cm (17.25 in.) Height: 13.3 cm (5.25 in.) Weight: 12.7 kg (28.0 lb) Operating environment Electrical: 90–264 V ac, 2.0A @ 90 V ac, 47–63 Hz Temperature: 0° to 40°C (32° to 104°F) Relative Humidity: 10–90% noncondensing	Memory • 512 MB memory Standard • 1.5 GB maximum Processor • Dual 2.2 GHz Intel Xeon processors Expansion slots • Five PCI expansion slots Max 3DES throughput • 375 Mb/s (450 Mb/s for AES) Standard equipment • 1 x 10/100 Base-T Ethernet ports • 1 x 10/100/1000 Base-T Ethernet Gigabit port • Management/console port (DB-9) • Dual Redundant, auto-switching power supply system with dual line cards • Dual Redundant, storage system Standard software • Nortel VPN Router O/S with 5000 VPN tunnels and IP routing LAN/WAN options • Additional 10/100 Base-T Ethernet or 1000 BaseSX/T Gigabit Ethernet • 1-port T1/E1 with CSU/DSU • 4-port T1/E1 with CSU/DSU • V.90 Dial Modem • ISDN BRI (S/T and U Interfaces) • ADSL • V.35/X.21/RS-232 Serial • 56/64K CSU/DSU • High-Speed Serial Interface (HSSI) Other hardware options • SSL VPN Module • Encryption Accelerator Card Physical dimensions Length: 53.3 cm (23 in.) Width: 43.8 cm (17.25 in.) Height: 13.3 cm (5.25 in.) Weight: 19.5 kg (43.0 lb) Operating environment Electrical: 100–127/200–240 V ac, (x2), 6.2/3.1A, 50-60 Hz Temperature: 0° to 40°C (32° to 104°F) Relative Humidity: 10–90% noncondensing
		

Ordering Information

For further information, contact your local Nortel representative.

Nortel Secure Router Portfolio

The new Nortel Secure Router portfolio is a family of enterprise access routers for enterprise branch offices and remote sites. Nortel Secure Router portfolio enables secure end-to-end converged solutions. The Secure Routers combine robust IP routing, flexible WAN connectivity, and security in a single cost-effective device. Ideal for enterprise branch, remote, or regional site environments with a converged voice and data infrastructure, Nortel Secure Routers deliver low-latency, high-packet throughput required by IP telephony and multimedia applications. Providing wire-speed performance with advanced WAN services enabled, they are the correct solution for enterprises requiring high-speed Internet or private WAN connectivity.

The Nortel Secure Router portfolio includes:

- Nortel Secure Router Platforms
 - Nortel Secure Router 1000 series
 - Nortel Secure Router 3210

Nortel Secure Router Platforms

Overview

The new Nortel Secure Router portfolio is a family of enterprise access routers for enterprise branch offices and remote sites. Nortel Secure Router portfolio enables secure end-to-end converged solutions. The Secure Routers combine robust IP routing, flexible WAN connectivity, and security in a single cost-effective device. Ideal for enterprise branch, remote, or regional site environments with a converged voice and data infrastructure, Nortel Secure Routers deliver low-latency, high-packet throughput required by IP telephony and multimedia applications. Providing wire-speed performance with advanced WAN services enabled, they are the correct solution for enterprises requiring high-speed Internet or private WAN connectivity.

In addition to their robust routing features, Nortel Secure Routers include an extensive suite of advanced security functions, including Virtual Private Networking (VPN), stateful packet inspection firewall, encryption, authentication, access controls, and network address translation (NAT). This built-in security protects against unauthorized access and network disruption, while helping to ensure the privacy and integrity of transmitted data.

The Nortel Secure Router family includes fixed-configuration 1000 series and modular 3120 platforms. All Nortel Secure Routers can be deployed in a variety of configurations to build an enterprise WAN infrastructure. The Secure Router 1000 Series is suited for small and medium remote sites or branches, while the 3120 is suited for large regional or headquarters locations where it can aggregate WAN links from multiple remote sites. The Secure Router family guarantees high-quality data, voice, video, and multimedia performance with advanced security features, low total cost of ownership, flexible deployment options, and fast, reliable application delivery.

Ideal For

- Institutions such as financial, educational, and medical with many remote or branch locations connected to a central headquarters or regional site.
- Government departments with many remote or branch locations connected to a central headquarters or regional site.
- Enterprises that want a reliable, high-performance WAN solution capable of handling converged voice and data applications.

Business Challenges

- Do you need a robust WAN router solution for your converged VoIP and data network?
- Do you want a low-cost alternative to the incumbent router vendor?
- Is integrated network security required at your branch and regional sites?
- Do you want to lower your total cost of ownership?

Features and Benefits

The Nortel Secure Router 1000 series and Secure Router 3120 deliver secure, high-performance end-to-end converged solutions using advanced technology.

- **High performance** means the routers in the Nortel Secure Router portfolio perform at wire speed even with small packet sizes and network services enabled.
- **Advanced technology** makes the routers in the Nortel Secure Router portfolio industry leaders.
- **Robust routing** features make the routers in the Nortel Secure Router portfolio industry leaders. The features include a full IP protocol set, which includes BGP-4 and multicast capabilities. The Secure Router routing services, in particular, are optimized to deliver the low-latency, high-packet throughput needed by VoIP and multimedia applications.
- **Integrated security features** include stateful packet firewall with SIP, H.323, and

other Application Layer Gateway (ALG) support; Distributed Denial of Services (DDoS) capabilities with protection from over 60 attacks; and built-in VPN acceleration hardware that supports IPSec VPN data encryption services.

- **Integrated solution** means that the routers in the Nortel Secure Router portfolio have a wide array of integrated capabilities, including IPSec, VPN, stateful firewall, built-in Ethernet ports, CSU, DSU, and drop-and-insert (DSX-1) voice support. This integrated support eliminates the need to buy extra equipment to support additional services.
- **Simplified user architecture** means Nortel offers command line interface scripting tools to deploy the routers quickly and to make ease maintenance.
- **Scalable design** means businesses can add Nortel Secure Routers as business needs change.
- **Advanced Quality of Service** provides the highest granularity of priorities (eight levels) for maximum performance and lowest latency for voice, video and other high-priority traffic.
- **Fast path-forwarding engine** helps to ensure reliable delivery of services and applications even as new services are enabled. This is unlike competitive routers that cannot sustain peak performance as new services are added. This performance advantage is verified by Tolly testing, which showed up to six times the throughput of comparable WAN routers from the leading competitors.
- **Multicast WAN services** allows bonding of T1/E1 and T3 interfaces to create a single virtual interface allowing cost-effective bandwidth scalability and resilient WAN operation. If one of the WAN links should fail, transmission can continue on the other bonded WAN links.
- **Virtual Ethernet technology** provides transparent LAN transport across wide-area network (WAN) links. Layer 2 tagging, forwarding, and NAT services help to ensure seamless LAN integration between remote geographic locations.

Nortel Secure Router 1000 series



The Nortel Secure Router 1000 series includes four Secure Routers: 1001, 1001S, 1002, and 1004. Each router in the Secure Router 1000 series delivers fast, secure, reliable, scalable wide area network (WAN) T1 or E1 access for enterprises. These powerful platforms provide consistent high-speed throughput with no degradation in performance, regardless of the number of advanced services the enterprise enables. The Secure Router 1000 series combines high performance and a robust features set. The Nortel Secure Router 1001, 1001S, and 1002 are entry-level edge routers that fully support advanced network services. The 1001, 1001S, and 1002 are ideal for branch offices that need one- or two-port T1 or E1 connectivity. The Nortel Secure Router 1004 is a scalable mid-range edge router. The Secure Router 1004 is ideal for enterprise locations that need four-port T1/E1 connectivity.

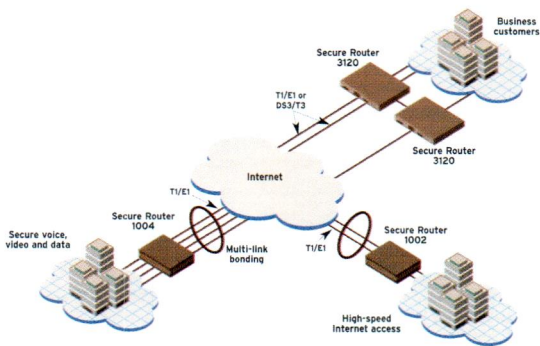
Nortel Secure Router 3120



The Nortel Secure Router 3120 is a powerful two-slot modular system that converges routing, security, and multimedia traffic forwarding in a single cost-effective platform. The Secure Router 3120 is a fault-tolerant high-end edge router. The Secure Router 3120 is ideal for high-performance aggregation with two DSX, 16 T1/E1 ports, and eight serial ports.

The Nortel Secure Router 3120 delivers fast, secure, reliable, and scalable wide area network (WAN) access, the Secure Router 3120 is perfect for enterprises requiring high-speed IP or Internet access. The Secure Router 3120 combines high performance, robust routing, and flexible WAN connectivity, the Secure Router 3120 is targeted at large branch and regional enterprise environments.

Network Diagram



Market Information

Nortel commissioned the Tolly Group to evaluate the Nortel Secure Routers 1002 and 1004 against their competitors in the market. Nortel Secure Routers 1002 and 1004 deliver wire-speed throughput at most packet sizes tested, while simultaneously processing a combination of QoS, NAT, ACL filters, IPSec VPN, and firewall services to outperform Cisco 1841, 2811, and 2821 routers.

In a scenario with the WAN routers supporting multilink PPP traffic across four T1s, the Nortel Secure Router 1004 outperformed the Cisco 2811 by delivering zero-loss aggregate throughput ranging from 3.9 Mb/s (64-byte frames) to 6.2 Mb/s, whereas the Cisco router delivered throughput ranging from 1.1 Mb/s to 4.1 Mb/s.

In a scenario with WAN routers supporting multilink PPP traffic across two T1s, the Nortel

Secure Router 1004 outperformed the Cisco 2811 and Cisco 1841 routers by delivering 3.1 Mb/s across the range of packet sizes tested, whereas the Cisco routers achieved an average of 2 Mb/s, and 1.25 Mb/s respectively.

In a series of tests performed by Tolly Group engineers on the the Nortel Secure Router 3120, the Nortel Secure Router 3120 delivered superior throughput for the majority of packet sizes, generally outperforming the Cisco Systems 3825 and 2821 Integrated Services Routers by delivering two to four times more throughput.

The Nortel Secure Router 3120 possesses an enormous amount of processing headroom to accommodate network services while simultaneously offering wire-speed throughput.

Technical Specifications

	 Nortel Secure Router 1001	 Nortel Secure Router 1001S	 Nortel Secure Router 1002	 Nortel Secure Router 1004	 Nortel Secure Router 3120
T1/E1 ports	1	1	2	4	16
Serial ports	N/A	1	1	N/A	8
DS3 ports	N/A	N/A	N/A	N/A	2 (clear channel or channelized)
CSU/DSU	Yes	N/A	Yes	Yes	Yes
Add/Drop Port (DSX)	N/A	N/A	1	1	N/A
Backup slot	ISDN-BRI (U&ST) factory installed option	ISDN-BRI (U&ST) factory installed option	N/A	N/A	N/A
USB	N/A	N/A	N/A	N/A	1 slot
Ethernet ports	Two 10/100				
CPU	266 MHz	266 MHz	300 MHz	300 MHz	400 MHz
Memory	128 MB	128 MB	256 MB	256 MB	256 MB
Console or Auxiliary Port	1/1	1/1	1/1	1/1	1/1
Compact Flash slot	Yes	Yes	N/A	N/A	Yes
VPN Acceleration	software based	software based	On-board hardware	On-board hardware	On-board hardware
Performance with service enabled	1x T1/E1 wire speed	1x T1/E1 wire speed	2x T1/E1 wire speed	4x T1/E1 wire speed	16x T1/E1 wire speed
Power	External ac/dc	External ac/dc	External ac/dc	External ac/dc	ac input current: 50–60 Hz 100–240 V, 80 Watts dc output current: –40 to –60 V dc (–48 V dc nominal)
Physical Dimensions	Height: 3.35 cm (1.32 in.) Width: 21.97 cm (8.6 in.) Depth: 16.54 cm (6.51 in.) Weight: 0.68 kg (1.5 lb)				Height: 4.41 cm (1.75 in.) Width: 43.82 cm (17.25 in.) Depth: 38.1 cm (15 in.) Weight: 5 kg (11 lb)
Mounting	Wall mount: Optimal Tabletop: Standard				
Environment	Temperature 0°– 40° C (32°– 104° F) Relative Humidity: 0 – 95 percent				

Ordering Information

For further information, contact your local Nortel representative.

Nortel Switched Firewall Portfolio

The Nortel Switched Firewall (NSF) portfolio products combine the best security firewall with the best network switching and acceleration. The Nortel Switched Firewall solution protects network applications and services including Session Initiation Protocol (SIP), VoIP, wireless, and delay-sensitive multimedia applications. Nortel Switched Firewall protects IT data centers, service provider networks, and hosting infrastructures from hacks, attacks, worms, and viruses. The Nortel Switched Firewall portfolio integrates Nortel accelerator technology and Firewall-1/VPN-1 from Check Point Software Technologies to create a high-performance, resilient security solution.

The Nortel Switched Firewall portfolio comprises the following products:

- Nortel Switched Firewalls
 - Nortel Switched Firewall 5106
 - Nortel Switched Firewall 5111
 - Nortel Switched Firewall 5114/5124
 - Nortel Switched Firewall 6416
 - Nortel Switched Firewall 6616
- Nortel Switched Firewall 5100 series
- Nortel Switched Firewall 6000 series

Nortel Switched Firewalls

Overview

Nortel Switched Firewalls (NSF) combines the best security firewall with the best network switching and acceleration. The Nortel Switched Firewall solution protects network applications and services including Session Initiation Protocol (SIP), VoIP, wireless, and delay-sensitive multimedia applications. Nortel Switched Firewall protects IT data centers, service provider networks, and hosting infrastructures from hacks, attacks, worms, and viruses. The Switched Firewalls integrate Nortel accelerator technology and Firewall-1/VPN-1 from Check Point Software Technologies to create a high-performance, resilient security solution.

Any firewall has three basic functions:

- **Policy inspection:** inspect all traffic and compare it to defined security rules.
- **Policy enforcement and data forwarding:** forward or block traffic based on the rules and signatures.
- **VPN gateway:** authenticate and terminate IPSec VPN tunnels from authorized remote access client devices.

The best security firewall available should protect the network. Consequently, Nortel collaborated with Check Point Software Technologies to create the Nortel Switched Firewalls.

Ideal for

The Nortel Switched Firewalls are ideal for:

- applications that need high connection rates (more than 1 Gb/s), high session connection rates and thousands of concurrent users
- customers use Check Point firewall or VPN on an old platform that needs reliable performance. Conversion to a Nortel Switched Firewall platform is easy and re-uses existing Check Point licenses
- cost-conscious organizations that centrally manage a deployment of global firewalls
- protection from current and future hacks, attacks, worms, and viruses
- organizations deploying SIP, VoIP, multimedia or other delay-sensitive applications or services
- service providers (wireless or wireline) protecting and enabling access to SIP and multimedia applications and services

Business Challenges

The business challenges to consider when deciding to purchase a Nortel Switched Firewall include:

- Do you need to provide needed security without compromising performance or resiliency?

- Do you want to achieve throughput and connection capacity necessary to support all of today's and tomorrow's applications and services?
- Do you want to deploy security solutions optimized to support SIP, VOIP, Web-services and multimedia applications?

Typical Applications

- **Block hacks, attacks, worms, and viruses.**
Nortel Switched Firewall has both network-level and application-level protection to guard against:
 - denial of service (DoS) attacks
 - oversized packets
 - SYN floods
 - fragmentation attacks
 - Nimda
 - Code Red
 - cross-site scripting, and other network- or application-based attacks
- **Support applications necessary for Web-services and multimedia deployment.**
Nortel Switched Firewalls have the broadest application support in the industry. Over 150 predefined applications help to ensure that Web services deployment can traverse the Switched Firewalls without performance

limitations. Application examples include:

- Microsoft CIFS
- SMTP, FTP, HTTP, DNS and telnet traffic
- SOAP/XML
- Instant Messaging and peer-to-peer applications
- Windows Media, RealVideo and Session Initiation Protocol (SIP)
- H.323-based services, including Voice over IP (VoIP) and NetMeeting
- Oracle SQL and ERP

- **Nortel Switched Firewall 5100 series.** The NSF 5100 series provide application-intelligent firewalls for small and medium businesses and at branch offices of larger organizations. Large organizations can manage their 6000 series firewalls and the branch firewalls with the same tools and processes.
- **Nortel Switched Firewall 6000 series.** The NSF 6000 series is used in medium to large organizations and service providers to provide high-performance, application-intelligent firewalls.

Key Points

The key points of the Nortel Switched Firewalls include:

- Customers can replace aging platforms running Check Point Firewall-1/VPN-1. The firewall license migrates and staff retraining is minimized.
- The Nortel Switched Firewall has the best price to performance ratio on the market making it the best choice for performance-hungry networks.
- Nortel fully supports the NSF through an ongoing, strategic relationship with Check Point.

Technical Specifications

Model / Feature	5106	5111	5114/5124 ¹	6416/6426 ¹	6616/6626 ¹
Throughput (Gb/s)	0.350	1.2	1.6	5.0	7.0
Connections per sec ²	3600	12 000	10 000	20 000 / Director	20 000 / Director
Accelerated concurrent sessions	0	0	0	750 000	750 000
Total concurrent sessions	250 000	300 000	500 000	2 000 000	2 000 000

Features and Benefits

The features and benefits of the Nortel Switched Firewall include:

- Protects wired and wireless networks from existing and new threats and attacks, including viruses, worms, and denial of service attacks.
- Integrates advanced FireWall-1/VPN-1 Next Generation from Check Point, a key Nortel Network security partner.
- Provides application-aware security services that protect new and emerging applications and services, such as SOAP/XML, SIP, VoIP, and peer-to-peer.
- Delivers as much as 7 Gb/s of throughput in high-availability configurations.
- Reduces cost of ownership by eliminating discrete firewall instances and improving overall firewall management and operation.

Market Information

The firewall market is well established. Nortel retains some specialized market share with NSF and VPN Router firewalls. Many organizations must reassess their firewall strategies and needs. Deploying VoIP, SIP, multimedia and wireless technologies drives this reassessment. Performance factors such as throughput, delay, connections per second, and total connections mean that older firewalls may need to be replaced. The Nortel Switched Firewall is ideal to support these new applications and services.

Model/Feature	5106	5111	5114/5124	6416/6426	6616/6626
Layer 3 protocols	OSPF	OSPF	OSPF	OSPF, RIP 1&2	OSPF, RIP 1&2
VPN Throughput 3DES ¹ (Mb/s)	55	88	88/350	88/350 per Director	88/350 per Director
VPN concurrent tunnels	10 000	10 000	25 000	25 000	25 000
Virtual Firewalls	No	No	Yes – 250	No	No
VLANs/IEEE 802.1q	Yes	Yes	Yes	Yes – up to 242	Yes – up to 242
Health checks & load balancing	No	No	No	Yes	Yes
Multilink trunking	No	No	No	Yes	Yes
Plug-and-Play	No	No	No	Yes	Yes
Single system image upgrade	Yes	Yes	Yes	Yes	Yes
Expansion options	No	upgrade available	upgrade available	Yes	Yes
High availability	Yes	Yes	Yes	Yes	Yes
Ethernet TX ports: 10/100	2	4	0	24	0
Ethernet TX ports: 10/100/1000	2	2	2	0	8 ³
Ethernet Fiber ports	0	0	2 x 1000SX	4 x GBIC	8 x GBIC ³

Notes:

¹ The NSF 5124 has a VPN Acceleration capability to improve encryption performance from 88 to 350 Mb/s. The NSF 5026 is a Director platform with the same VPN Acceleration capability. Multiple (up to six) NSF 5026 can be clustered with 6400 or 6600 Switched Firewall Accelerators to create a high-performance VPN cluster with up to 2 Gb/s of 3DES throughput.

² Multiple Directors (up to six) can be load balanced to achieve up to 100 000 connections per second in an accelerated cluster.

³ Any 12 ports can be enabled at one time on the Switched Firewall Accelerator 6600.

Ordering Information

For further information, contact your local Nortel representative.

Nortel Switched Firewall 5100 Series

Overview

The Nortel Switched Firewall 5100 series supports high-availability modes, routing, network topology, IPSec VPN, and other technologies that make it easy to deploy these technologies and support them in any network. The 5100 series firewall inspects traffic to help ensure that no attacks, viruses, or worms pass through the firewall.

The series includes:

- wire-speed packet forwarding for assured performance
- simplified network topology for easy management and troubleshooting
- rapid service restoration using common protocols
- protection from application-level attacks using Check Point Smart Defense functionality

The Switched Firewall 5100 series offers stand-alone deployments for small or medium businesses or branch offices.

Typical Applications

Examples of typical applications for the Nortel Switched Firewall 5100 series include:

- **Protection for voice and multimedia services:** companies deploy voice over IP (VoIP) and Session Initiation Protocol (SIP) services to enhance productivity. The added flexibility and mobility from these services means that VoIP and SIP traffic needs to traverse the firewall, presenting many potential problems. Traditional firewalls might not support the complexity of signaling used by these services. Many existing firewall implementations add too much delay or jitter into the media path and adversely affect the voice or multimedia quality. High packet throughput to minimize delay, VoIP, and SIP application awareness and virtually jitter-free performance are fundamental to the Switched Firewall 5100 series design and function.
- **Minimize cost of operation:** network traffic is growing. Dependence on communication and interaction means that security solutions must be cost-effective and able to grow to meet future demands. The Nortel Switched Firewall 5100 Series can grow to meet future demands. An initial system with one Switched Firewall supports up to 10 000 connection requests per second and 500 000 total concurrent sessions. As the network traffic increases, a Switched Firewall Accelerator can be added. A Switched

Firewall Accelerator can support up to six Switched Firewalls to provide up to 100 000 connection requests per second and 6 000 000 total concurrent sessions. Adding capacity to a Switched Firewall System is easy. A Single System Image controls all configuration data, including physical interfaces, VLANs, IP interfaces, routing protocols, and administrative settings. This data is shared securely and automatically within the Switched Firewall cluster. In addition, the cluster is managed through a single IP address, making it easy to perform configuration changes, backup configuration data, and update software for all units in the cluster. An existing Check Point customer can re-use an existing license to move the firewall easily onto any Nortel Switched Firewall System.

Features and Benefits

The features and benefits of the Nortel Switched Firewall 5100 series include:

- protects and supports SIP, VoIP, wireless, and other advanced services with no performance impact
- combines Check Point security with Nortel networking to create a security solution that eliminates boundaries while protecting resources
- improves the performance compared to server-based firewall deployments

Technical Specifications

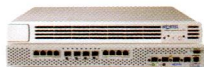
Part numbers	Description
EB1639107	–Switched Firewall 5106: 2 x 10/100/1000 Base-TX ports, 2 x 10/100 Mb/s ports
EB1639127	–Switched Firewall 5111: 2 x 10/100/1000 Base-TX ports, 4 x 10/100 Mb/s ports
EB1639128	–Switched Firewall 5114: 2 x 1000 Base-SX ports, 2 x 10/100/1000 Mb/s ports
EB1639129	–Switched Firewall/VPN 5124: 2 x 1000 Base-SX ports, 2 x 10/100/1000 Mb/s ports and VPN-acceleration card
Interfaces	–10 Base-T/100 Base-TX Port 10/100 full or half-duplex (auto-negotiation) with RJ-45 UTP port –1000 Base-SX Port full-duplex Gigabit Ethernet with SC fiber connector –RS-232C Console DB-9 serial connection, female DCE interface for out-of-band management
Dimensions	
Height	4.44 cm (1.75 in.)
Width	42.39 cm (16.69 in.)
Depth	42.01 cm (16.53 in.)
Weight	8.6 kg (19 lb) (Standard 48.3 cm (19 in.) EIA 1U rack-mountable)
Network protocol and standards compatibility	–10 Base-T/100 Base-TX/1000 Base-TX (IEEE 802.3-2000) –1000 Base-SX/LX (IEEE 802.3z) –Logical link control (IEEE 802.2) –Flow control (IEEE 802.3x) –Link negotiation (IEEE 802.3z) –Port Trunking (IEEE 802.3d) –VLANs (IEEE 802.1Q): Frame tagging on all ports when LANs enabled –IP (RFC 791) –ICMP (RFC 792) –ARP (RFC 826) –RIP 1 (RFC 1058), RIP 2 (RFC 1723) –OSPF with md5 authentication (RFC 2328) –VRRP (RFC 2338) –CIDR (RFC 1519) –TFTP (RFC 783), FTP (RFC 959) –Telnet (RFC 854) –SSH v1/v2 –SSL/TLS (RFC 2246) –DVMRP (RFC 1075) –IGMP (RFC 2236) –BootP/DHCP Relay (RFC 2131) –SNMPv2c (RFCs 1901, 1905, 1906, 1907, 2578, 2579, 2580) –SNMPv3 (RFCs 2570, 2571, 2572, 2573, 2574, 2575)
Power specifications	–Autoranging power supply: 0–240 V ac @ 3.5 Amps, 50–60 Hz –Maximum power consumption: 250 Watts –MTBF: > 50 000 hours
Environmental specifications	–Operating temperature: 10° to 35°C (45° to 100°F) –Operating humidity: 8% to 80% (noncondensing)

Certifications	EMC: (Electromagnetic requirements) –U.S.: FCC Part 15, Subpart B Class A –Australia: AS/NZS CISPR 22:2002 –Canada: ICES-003 –Japan: VCCI Class A –Europe: EN 300 386 v1.3.1 (2001-09) –Taiwan: BSMI Registration Certificate –Rest of World: CISPR 22 Class A
Emissions	–U.S.: FCC Class B –Canada: DOC Class B –Europe: CE Mark to EN55022/EN50082-1/ICE 801-2/ICE 801-3/ICE 801-4
Industry	–EAL-4 –OPSEC –ICSA
Safety	–IEC 60950 (International) –National Deviation per CB Member Countries to IEC 60950 –UL 1950 (USA) –CSA 22.2, No. 950 (Canada) –EN 60950 (Europe)

Ordering Information

For further information, contact your local Nortel representative.

Nortel Switched Firewall 6000 Series



Overview

The best security firewall available should protect your network. This is why Nortel collaborated with Check Point Software Technologies to create the Nortel Switched Firewall 6000 series.

The Nortel Switched Firewall 6000 series is certified under the Check Point Open Platform for Security (OPSEC) criteria and enhances the FireWall-1 deployment with unique services and capabilities.

Typical Applications

• Layer 2 through Layer 7 content filtering

The Switched Firewall System performs full inspection of any IP application header or payload. This information is used to apply firewall rules to the network data flows. This capability enables the switched firewall to block attacks and unauthorized traffic before performance degradation or a network outage. Configure up to 224 filtering rules to grant or deny traffic access based on application type, protocol type, and IP source or destination addresses.

• Device load balancing

Up to six Switched Firewall Directors can be load balanced with a single Switched Firewall Accelerator. Health checks help to ensure availability. In addition, Intrusion Detection Systems (IDS) can be load balanced from the Switched Firewall System. Multiple systems can be run in parallel across multiple security zones or VLANs with the Switched Firewall System ensuring that all sessions and all frames are sent to the same IDS system.

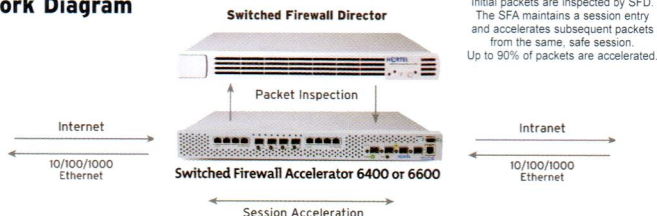
• VLAN tagging

Support exists for as many as 242 individual VLANs. Unique security policy implementation and enforcement exists for each VLAN. The 6414 and 6614 are ideal for deployment in multitenant or multidepartment environments that require unique security policies and inter-VLAN policy inspection. Examples include airports, government offices, malls, stadiums, schools, universities, and hospitals.

* Network address translation

The Switched Firewall System performs Network Address Translation (NAT) to preserve and hide organizational IP addresses. With this accelerated-NAT function performed in the switch hardware, the core firewall system devotes its resources to session connections and complex security concerns—no performance or throughput degradation occurs. Traditional firewalls often cause degradations in network performance and throughput when invoking NAT functions.

Network Diagram



Key Points

Nortel combines industry-leading network switching and acceleration with the best security firewall from Check Point. The combined system supports secure access to enterprise resources including SIP, VoIP, and other delay-sensitive applications without compromising performance. The Nortel Switched Firewall 6000 series also:

- recognizes and blocks network, application, and protocol attacks (DoS, SYN, Nimbda, Code Red, Scripts)
- optimized for SIP, VoIP, multimedia, and other real-time applications and services
- field-proven, network-based solution supports Layer 2 and Layer 3 modes for flexible deployment, which combined with the Nortel Threat Protection System, provides an adaptive defense against emerging attacks

Features and Benefits

Examples of the features and benefits of the Nortel Switched Firewall 6000 series include:

- intelligent security with high performance:
 - Throughput of 7 Gb/s
 - Connections per second from 20 000 to 100 000
 - Concurrent accelerated sessions of 1 000 000
- Plug-and-Play deployment and expansion with a single-system-image that is easy to manage and maintain
- multilayer packet inspection for extra protection from advanced hackers and attackers
- optimized security with switch-based acceleration that off-loads CPU processing and minimizes affect on next-generation multimedia, SIP, and VoIP services
- device load balancing for advanced support of Threat Protection Systems or VPN Gateways
- active-active configurations for high availability environments where 99.999 percent application and service availability is necessary

Technical Specifications

Part numbers	Description
EB 1639174	Switched Firewall System 6616, complete with Accelerator and Director
EB 1639113	Switched Firewall Accelerator 6600, to upgrade an existing Director or to create a High Availability configuration
EB 1639173	Switched Firewall System 6416, complete with Accelerator and Director
EB 1639067	Switched Firewall Accelerator 6400, to upgrade an existing Director or to create a High Availability configuration
EB1639130	Switched Firewall Director 5016

Interfaces

Accelerator	–10/100/1000 Base-TX Port 10/100/1000 full or half-duplex (autonegotiation) with RJ-45 UTP port –1000 Base-SX Port 1-port 1000 Base-SX SFP GBIC (Con. Type: LC) –1000 Base-LX Port 1-port 1000 Base-LX SFP GBIC (Con. Type: LC) –RS-232C Console DB-9 serial connection, female DCE interface for out-of-band management
Director	–10 Base-T/100 Base-TX Port 10/100 full or half-duplex (auto-negotiation) with RJ-45 UTP port –RS-232C Console DB-9 serial connection, female DCE interface for out-of-band management

Dimensions		
	Accelerator	Director
Height	4.44 cm (1.75 in.)	4.44 cm (1.75 in.)
Width	44.0 cm (17.61 in.)	42.39 cm (16.69 in.)
Depth	50.8 cm (20 in.)	42.01 cm (16.53 in.)
Weight	9.53 kg (21 lb) (Standard 48.3 cm (19 in.) EIA 1U rack-mountable)	8.6 kg (19 lb) (Standard 48.3 cm (19 in.) EIA 1U rack-mountable)
Technical specifications	-IP routing interfaces 256 -VLANs 252 -Default gateways 4 -Trunk groups 12	
Network protocol and standards compatibility	-10 Base-T/100 Base-TX/1000 Base-TX (IEEE 802.3-2000) -1000 Base-SX/LX (IEEE 802.3z) -Logical link control (IEEE 802.2) -Flow control (IEEE 802.3x) -Link negotiation (IEEE 802.3z) -Port Trunking (IEEE 802.3d) -VLANs (IEEE 802.1Q): Frame tagging on all ports when LANs enabled -IP (RFC 791) -ICMP (RFC 792) -ARP (RFC 826) -RIP 1 (RFC 1058), RIP 2 (RFC 1723) -OSPF with md5 authentication (RFC 2328) -VRRP (RFC 2338) -CIDR (RFC 1519) -TFTP (RFC 783), FTP (RFC 959) -Telnet (RFC 854) -SSH v1/v2 -SSL/TLS (RFC 2246) -DVMRP (RFC 1075) -IGMP (RFC 2236) -BootP/DHCP Relay (RFC 2131) -SNMPv2c (RFCs 1901, 1905, 1906, 1907, 2578, 2579, 2580) -SNMPv3 (RFCs 2570, 2571, 2572, 2573, 2574, 2575)	
Power specifications	-Autoranging power supply 00-240 V ac @ 3.5 Amps, 50-60 Hz -Maximum power consumption 250 Watts -MTBF >50 000 hours	
Environmental specifications	-Operating temperature: 10° to 35°C (45° to 100°F) -Operating humidity: 8% to 80% (noncondensing)	
Certifications	-EMC: (Electromagnetic requirements) -U.S.: FCC Part 15, Subpart B Class A -Australia: AS/NZS CISPR 22:2002 -Canada: ICES-003 -Japan: VCCI Class A -Europe: EN 300 386 v1.3.1 (2001-09) -Taiwan: BSMI Registration Certificate -Rest of World: CISPR 22 Class A	
Emissions	-U.S.: FCC Class B -Canada: DOC Class B -Europe: CE Mark to EN55022/EN50082-1/ICE 801-2/ICE 801-3/ICE 801-4	

Industry	-EAL-4 -OPSEC -ICSA
Safety	-IEC 60950 (International) -National Deviation per CB Member Countries to IEC 60950 -UL 1950 (USA) -CSA 22.2, No. 950 (Canada) -EN 60950 (Europe)

Ordering Information

For further information, contact your local Nortel representative.

Nortel Threat Protection System Portfolio

Nortel Threat Protection System portfolio takes a snort-based Intrusion Detection System (IDS) and combines it with the best switched firewall for adaptive threat protection in the industry. The combined system defends the network against hacks, attacks, worms, and viruses. This technology now extends to a multilayer in-line Intrusion Prevention System (IPS) model and a Real-time Threat Intelligence system.

The Nortel Threat Protection System portfolio comprises the following products:

- Nortel Threat Protection System
 - Nortel Defense Center 2050-IS
 - Nortel Intrusion Sensor 2070-IS
 - Nortel Defense Center 2070-DC
 - Nortel Intrusion Sensor 2150-IS
 - Nortel Intrusion Sensor 2170-IS
 - Nortel Threat Intelligence 2050-TI
 - Nortel Threat Intelligence 2070-TI
 - Nortel Real-time Threat Intelligence Licenses

Nortel Intrusion Sensors and Threat Intelligence

Overview

Nortel takes a snort-based Intrusion Detection System (IDS) and combines it with the best switched firewall for adaptive threat protection. The combined system defends the network against hacks, attacks, worms, and viruses. This technology now extends to a multilayer in-line Intrusion Prevention System (IPS) model and a Real-time Threat Intelligence system. Together these systems provide:

- high-speed preprocessing and analysis of threat traffic
- multilayer inspection and anomaly scanning to detect sophisticated and emerging threats
- a signature database that uses the worldwide knowledge of the SNORT user community
- information from advanced queries and reports results in effective network protection and enables measurement of organizational security compliance
- total support from Nortel, including signature updates, makes Threat Protection Systems (TPS) easy to deploy and support

Ideal For

Medium to large organizations including health care, finance, manufacturing, transportation, utilities, service industry, governments, education and high technology sector that:

- must comply with corporate and government security regulations
- are concerned about worms, viruses, and attacks that cause disruption and cost real money
- value secure remote access for employees, partners, and customers
- need advanced threat detection and blocking to ensure critical business systems are not compromised
- require application-aware security solutions that adapt to changing network requirements and evolving threat profiles

Service organizations offering managed security services to enterprises of all types and sizes. These organizations can be a systems integrator, value-added-resellers (VAR), a service provider, a landlord, a government agency or an in-house service bureau in a large or global company.

Service requirements:

- must meet service level agreements and help show security policy compliance and effectiveness
- need effective threat information to plan and troubleshoot because it affects service profitability

- need to ensure multidomain secure remote access
- need advanced threat detection and blocking to ensure critical systems are not compromised
- require application-aware solutions that adapt to changing network requirements and evolving threat profiles

Business Challenges

- Security incidents are on the rise with over 140 000 reported in 2004.
- The sophistication and complexity of attacks are increasing.
- Increased mobility and access create new ways for threats to penetrate network defenses.
- New regulatory requirements and corporate security audits increase the need for security knowledge and reporting.

Typical Applications

Threat Detection with Intrusion Sensors

- Multilevel Inspection: a rule-based detection method that examines protocol fields looking for specific attack profiles. This catches threats hidden deep within the data payload.
- Anomaly Detection is a Switch-based, preprocessing method that performs complex stateful protocol analysis and normalization. This detects unusual traffic flows such as port scans, IP stack fingerprinting, denial of service attacks, and ARP spoofing.

Real-time Threat Intelligence

- Monitor and profile all assets and traffic flows on the network: any IP address that is a potential

source or target of an attack. Analysis of real-time threat intelligence and flagging of security events by the Intrusion Sensors create an accurate threat assessment. Immediate manual or automatic action blocks or isolates the threat.

Threat Analysis

- Queries and Reports: provide a detailed analysis of security alerts and events. This enables administrators to determine quickly the response to a new or ongoing threat. Full reporting capabilities enable users to correlate event information for forensic analysis, archiving, and compliance.
- Trap and Trace: administrators can tag and record sessions that follow a threat event. This capability records subsequent information and is useful in fully analyzing the impact, the source, and the target of an attack.
- Event Database: the high-performance database in the Defense Center management console handle millions of events. Support for in-depth forensic analysis helps identify long-term security trends. The database is preinstalled, preconfigured, and self-maintaining. Administrators can focus on event consolidation and analysis.

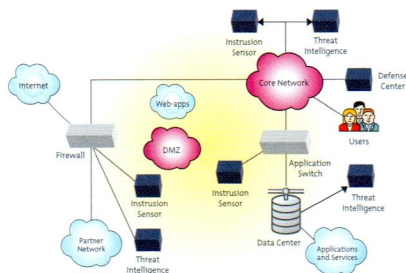
Threat Response

- In-line Threat Protection: in-line Intrusion Sensors: use multilevel inspection, anomaly detection, and real-time threat intelligence to find threats. Traffic flows are dropped or rate-limited after detection to mitigate an attack.
- Adaptive Defense with Real-time updates: off-line Intrusion Sensors use multilevel inspection, anomaly detection, and real-time threat intelligence to find threats. After detection, real-time updates are sent to Nortel Switched Firewalls and Application Switches.

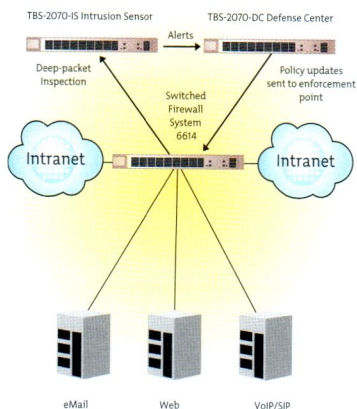
Policy Management and Configuration Control

- The Defense Center: manages sensor policies, configures alert responses and sets user administration privileges from one central location. A single Defense Center supports a large hierarchical group of Threat Intelligence and Intrusion Sensors. It aggregates and presents event data from across the grid of sensors. Security administrators use the analysis tools in Defense Center to correlate and analyze network or application threats.

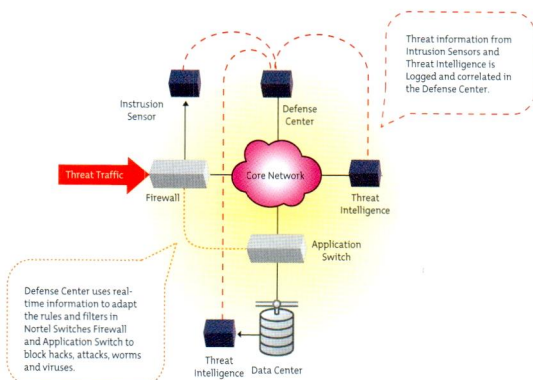
Network Diagrams



Deploying TPS in a Network



Threat Response with Nortel Switched Firewall



Real-time Intelligence and Intrusion Detection Result in Adaptive Defense

Features and Benefits

Feature	Benefit
Detect known threats via deep-packet pre-processing, normalization and inspection.	Expose defense weaknesses and enables administrators to take corrective actions.
Detect unknown threats via anomaly scanning.	Give early warning against emerging threats or malicious internal activity.
A flexible rule set and administrative structure.	Eliminate the expense of false alarms.
Keep up-to-date on new threats and vulnerabilities via the SNORT community and a dedicated team of security experts.	Help to maintain the most effective security posture possible.
Query and report on threats and event data.	Gain a better understanding of ability to protect the network.

Trap and trace traffic associated with any attack.	Analyze all critical information to formulate response to generic or specialized attacks.
Create an adaptive defense that responds immediately to block new and emerging threats.	Detect and block threats or attacks by updating Switched Firewall, Router, or Application Switch rules and filters before application availability or performance can be impacted.

Market Information

In 2004, reported attack incidents exceeded 150 000. The Internet now connects more than 180 million computers and attack technology has advanced. Organizations continued to see a rise in both the number of security and the sophistication of the attacks. A significant concern is a Zero Day attack—attacking vulnerabilities before they are announced, before the vendor issues patch, or before an

anti-virus vendor issues an update. In a Zero Day attack scenario, an otherwise unknown vulnerability has exploit code readily passing through the Internet before customers are aware of the vulnerability. Often, no time is available to test and issue a patch. The Nortel Layered Defense Approach to network security including Threat Protection System helps to mitigate the damage of known, emerging, and unknown threats.

Technical Specifications

Part numbers and description

Part #	Model #	Description
EB1639140	TPS 2050-IS	Threat Protection System 2050 Intrusion Sensor with 150 Mb/s of intrusion sensing. Includes 4 x 10/100/1000 TX. System has 1 GB RAM and 80 GB HDD.
EB1639141	TPS 2070-IS	Threat Protection System 2070 Intrusion Sensor with 1 Gb/s of intrusion sensing. Includes 4 x 10/100/1000 TX. System has 2 GB RAM and 80 GB HDD along with dual CPU.
EB1639142	TPS 2070-DC	Threat Protection System 2070 Defense Center console and management software.
EB1639155	TPS 2150-IS	Threat Protection System 2150 Intrusion Sensor with 100 Mb/s of intrusion sensing and a bypass NIC for inline operation. Includes 4 x 10/100/1000 TX. System has 1 GB RAM and 80 GB HDD.
EB1639156	TPS 2170-IS	Threat Protection System 2170 Intrusion Sensor with 1000 Mb/s of intrusion sensing and a bypass NIC for inline operation. Includes 4 x 10/100/1000 TX. System has 2 GB RAM and 80 GB HDD along with dual CPU.
EB1639158	TPS 2050-TI	Threat Protection System 2050 Threat Intelligence processes 100 Mb/s of traffic and supports real-time threat analysis for 8192 nodes. Includes 4 x 10/100/1000 TX. System has 1 GB RAM and 80 GB HDD.
EB1639159	TPS 2070-TI	Threat Protection System 2070 Threat Intelligence processes 1000 Mb/s of traffic and supports real-time threat analysis for 65 000 nodes. Includes 4 x 10/100/1000 TX. System has 2 GB RAM and 80GB HDD along with dual CPU.
EB1639160	TPS-RTI-5	Real-time Threat Intelligence License: up to 511 nodes
EB1639161	TPS-RTI-10	Real-time Threat Intelligence License: 512 to 1023 nodes
EB1639162	TPS-RTI-20	Real-time Threat Intelligence License: 1024 to 2047 nodes
EB1639163	TPS-RTI-40	Real-time Threat Intelligence License: 2048 to 4095 nodes
EB1639164	TPS-RTI-80	Real-time Threat Intelligence License: 4095 to 8191 nodes

EB1639165	TPS-RTI-160	Real-time Threat Intelligence License: 8192 to 16 383 nodes
EB1639166	TPS-RTI-320	Real-time Threat Intelligence License: 16 384 to 32 767 nodes
EB1639167	TPS-RTI-Plus	Real-time Threat Intelligence License: 32768 plus nodes

Specification

Interfaces	-Includes 4 x 10/100/1000 TX -RS-232C Console DB-9 serial connection, female DCE interface for out-of-band management
Dimensions	-Height: 4.44 cm (1.75 in.) -Width: 44.0 cm (17.61 in.) -Depth: 50.8 cm (20 in.) -Weight: 9.53 kg (21 lb) (Standard 19 in. EIA one-rack unit mountable)
Network protocol and standards compatibility	-10BASE-T/100BASE-TX/1000BASE-TX (IEEE 802.3-2000) -1000BASE-SX/LX (IEEE 802.3z) -Logical link control (IEEE 802.2) -Flow control (IEEE 802.3x) -Link negotiation (IEEE 802.3z) -IP (RFC 791) -ICMP (RFC 792) -ARP (RFC 826) -TFTP (RFC 783), FTP (RFC 959) -Telnet (RFC 854) -SSH v1/v2 -SSL/TLS (RFC 2246) -BootP/DHCP Relay (RFC 2131) -SNMPv2c (RFCs 1901, 1905, 1906, 1907, 2578, 2579, 2580) -SNMPv3 (RFCs 2570, 2571, 2572, 2573, 2574, 2575)
Power specifications	-Autoranging power supply 00–240 V ac at 3.5 Amps, 50–60 Hz -Maximum power consumption 250 Watts -MTBF >50 000 hours -Environmental specifications -Operating temperature 10 to 35° C (+45° – +100° F) -Operating humidity 8% to 80% (noncondensing) -Certifications
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Ordering Information

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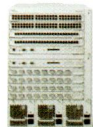
Nortel Ethernet Routing Switch Portfolio

The Nortel Ethernet Routing Switch portfolio consists of the Nortel Ethernet Routing Switch products to deliver reliable, secure, high-performance, intelligent Ethernet connectivity for today's convergence and Web-based applications. The portfolio offers resilient Ethernet switching products for organizations of all sizes. The products securely deliver Layer 2 and Layer 3 connectivity combined with Layer 4 through Layer 7 content-aware intelligence. Integrated network security technologies provide a comprehensive security solution throughout the local area network. Enterprises that want a reliable, secure, cost-effective offering to accommodate converged application requirements find an ideal product among those in the Nortel extensive Ethernet Routing Switch portfolio.

The Nortel Ethernet Routing Switch portfolio includes:

- Nortel Ethernet Routing Switch 8600 series
 - 8003/8006/8010/8010CO ERS 8600 Chassis
 - 8000 Routing Switch Software kit
 - Ethernet Routing Switch Fabric 8692SF module
 - Enhanced CPU daughter card (SuperMezz) for 8692SF
 - Ethernet Routing Switch 8648GTR module
 - 8630 GBR30 Routing Switch module
 - 8683 XLR 10 Gigabit Ethernet Interface module
 - 8663 XZR3 Routing Switch module
- Nortel Ethernet Routing Switch 8660 Service Delivery Module (SDM)
- Nortel Ethernet Routing Switch 8600 Web Switching Module (WSM)
- Nortel Ethernet Routing Switch 8661
- Nortel Ethernet Routing Switch 8300 series
 - 8306/8310 ERS 8300 Chassis
 - 8393 Switch Fabric Module
 - 8348GTX /PWR 48-port 10/100/1000 /PoE 802.3af
 - 8348TX /PWR 48-port 10/100 /PoE 802.3af
 - 8324GT 24-port Gigabit Ethernet SFP
 - 8324FX 24 port FX100 Megabit fiber
- Nortel Ethernet Routing Switch 1600 series (1612G/ 1624G/ 1648T)
- Nortel Ethernet Routing Switch 1424T
- Nortel Ethernet Routing Switch RPS 15
- Nortel Ethernet Routing Switch 3510-24T
- Nortel Ethernet Routing Switch 5510 series
- Nortel Ethernet Routing Switch 5520 series
- Nortel Ethernet Routing Switch 5530-24TFD

Nortel Ethernet Routing Switch 8600 Series



Overview

The Nortel Ethernet Routing Switch 8600 series delivers a reliable, secure, and intelligent network routing solution for today's convergence and Web-based applications that need a reliable, secure, intelligent network, such as IP Telephony, collaboration tools, Enterprise Resource Planning (ERP), Customer Resource Management (CRM), supply chain management, Unified Messages, and Call Center (ACD). Hardware-based wire-speed performance, combined with Quality of Service (QoS) mechanisms, enable fast, efficient traffic classification, policy enforcement, and filtering. Time-sensitive applications such as video and voice benefit from better application response times and fewer dropped calls when compared with networks using other Ethernet routing switches.

The Ethernet Routing Switch 8600 is a hardware-based Layers 2 through 7 routing and traffic classification switch that specifically offers high-level resiliency, a large number of high-bandwidth connections, and wire speed performance. Ethernet connectivity options include 10/100/1000 copper, Ethernet 100 and 1000 fiber, Ethernet, 10 Gigabit Ethernet, coarse wavelength division multiplexing (CWDM), asynchronous transfer mode (ATM) and packet-over-SONET (POS). The Ethernet Routing Switch 8600 series delivers a unique solution by combining performance, intelligence, and 99.999 percent reliability in one solution.

The Ethernet Routing Switch 8600 uses a common operating system base. The tangible business benefit for the customer is that features operate in a consistent manner with minimal configuration and operational costs.

The Ethernet Routing Switch 8600 series supports next-generation network access control: Nortel Secure Network Access 4050 release 1.1, a Nortel initiative that capitalizes on all of the advantages of third-party authentication and host integrity checking solutions. Nortel Secure Network Access 4050 delivers these solutions with the added advantages being fully integrated with security policy and authorization systems without being client dependent.

With the latest release of Ethernet Routing Switch 8600 hardware and software, Nortel introduces the next evolution in networking with the Resilient Terabit Cluster. This solution combines the resiliency features of the Ethernet Routing Switch 8600 with terabit performance and scalability to create a highly resilient, high-performance secure solution.

The latest software release, release 4.1, advances the recently launched 8692SF and R-Modules by adding IPv6, IPFIX (IETF RFC 3917) and sub-100-ms failover SMLT. Release 4.1 combines the functionality of 3.7.X (Software features) and 4.0.X (R-modules hardware). The availability of the Service Delivery Module with Threat Protection System and Switched Firewall is integrated and advanced.

The Ethernet Routing Switch 8600 series uses pairs of switches to function as one logical switch so that the Ethernet Routing Switch 8600 can deliver terabit performance while providing industry-leading resiliency.

The Ethernet Routing Switch 8600 series comprises the following components:

Component	Description
Ethernet Routing Switch 8600 Chassis (8003)	3-slot chassis equipped with a fan tray, RS-232 cable for management console, rack-mount kit, and cable guide kit. The 8003 chassis requires at minimum of one 8003 power supply (not included); supports as many as two power supplies. Minimum software version: 3.1.2.
Ethernet Routing Switch Chassis 8600 (8006)	6-slot chassis equipped with dual backplane, fan tray, RS-232 cable for management console, rack-mount kit, and cable guide kit. Supports up to three power supplies (not included).
Ethernet Routing Switch Chassis 8600 (8010)	10-slot chassis equipped with dual backplane, two fan trays, RS-232 cable for management console, rack-mount kit, and cable guide kit. Supports up to three power supplies (not included).
Ethernet Routing Switch Chassis 8600 (8010CO)	10-slot NEBS chassis for the Central Office equipped with fan trays, RS-232 cable for management console, rack-mount kit, and cable management. Requires a minimum of two 8004 power supplies (not included). Supports as many as three power supplies. Minimum software version: 3.1.2.
8000 Routing Switch Software kit (includes v.4.0 software license)	The 8000 Routing Switch software kit v. 4.0 includes a v.4.0 software license, device manager, and complete software documentation kit. One license kit is required for each chassis. Support contracts must be purchased separately.
Ethernet Routing Switch Fabric 8692 SF module	Enables redundant terabit core configurations. One 8692SF module is required with Ethernet Routing Switch R-modules. A second is required for loadsharing and redundancy. Includes 256 MB SDRAM and 64 MB PCMCIA. As of June, 2006, equipped with factory-installed Enterprise Enhanced CPU daughter card (SuperMezz). The SuperMezz daughter card upgrade is mandatory for IPv6 or sub-100 ms failover for customers with pre-June 2006 8692SF modules.
Enhanced CPU daughter card (SuperMezz) for 8692SF	The Enterprise Enhanced CPU daughter card (SuperMezz) allows customers to upgrade their Ethernet Routing Switch 8692 SF modules to support IPv6 or sub-100-ms failover and Metro applications. The SuperMezz interoperates with all existing 3.x I/O modules.
Ethernet Routing Switch module 8691SF	Comes with 256 MB CPU memory CPU/Switch Fabric module - One required for each Ethernet Routing Switch 8000 Routing Switch chassis. Note: Includes 6 4-MB PCMCIA flash memory card and 256 MB motherboard DRAM.
Ethernet Routing Switch 8468GTR module	48-port autosensing 10Base-T/100 Base-TX/1000 Base-T Ethernet Layer 3 switching interfaces introduced with release 4.0. Compatible with 8690SF, 8691SF and 8692 SF. Provides deep-packet capabilities and support for full Internet routes: • applications • server connectivity • desktop connectivity

8630 GBR30 Routing Switch module	30-port SFP GBIC baseboard introduced with release 4.0 (SFPs not included). • nonblocking • Deep packet inspection capabilities • SW upgradeable data path (for IPv6, MPLS, IPFix) • Support for full Internet Routes • Applications: –Distribution Layer Connectivity (SX, LX) –Server Connectivity (TX, SX) –Core Connectivity (LX, SX) –Metro Applications (CWDM, LX, DWDM) • Operation specifics: –Requires 8692SF –Operates in default, M and R modes
8683 XLR 10 Gigabit Ethernet Interface module	3-port 10 G Base-X XFP Routing Switch Module baseboard introduced with release 4.0 (XFPs sold separately).
8683 XZR3 Routing Switch module	3-port 10 G Base-X XFP Routing Switch Module baseboard introduced with release 4.1 (XFPs purchased separately). Supports: • LAN and WAN PHY • nonblocking • deep packet inspection capabilities • software upgradeable data path (for IPv6, MPLS, IPFix) • full Internet routes • Applications: –Distribution Layer Connectivity (SR, LR) –Server Connectivity (SR) –Core Connectivity (SR, LR, ER) –Metro Applications (LR, ER) • Operation specifics: –Requires 8692SF –Operates in default, M and R modes

Ideal For

- enterprises where network uptime is critical
- enterprises looking for a solution that integrates network traffic intelligence with security
- organizations such as finance, health care, government and education

Business Challenges

Enterprises

- Is application reliability critical to your business?
- Are you relying on your network to set your business apart?
- Are you experiencing increased competition?
- Are you looking to reduce your networking costs?
- Are you trying to increase employee productivity?
- Are there an increasing number of bandwidth-sensitive applications on your network?
- Do you require subsecond recovery from failures?
- Do you plan to upgrade your existing Ethernet network?
- Do you plan to unify your communications onto

one network?

- Do you plan to deploy Web hosting services?
- Do you plan to deploy Quality of Service?
- Do you plan to deploy VoIP?
- Do you plan to deploy multimedia applications?
- Do you plan to deploy desktop-based instruction?
- What are your plans for deploying 10 Gigabit Ethernet (10 GbE)?

Typical Applications

- enterprise IP routing
- IP multicasting
- Web hosting
- metropolitan inter-site connectivity
- multimedia and VoIP-ready LAN

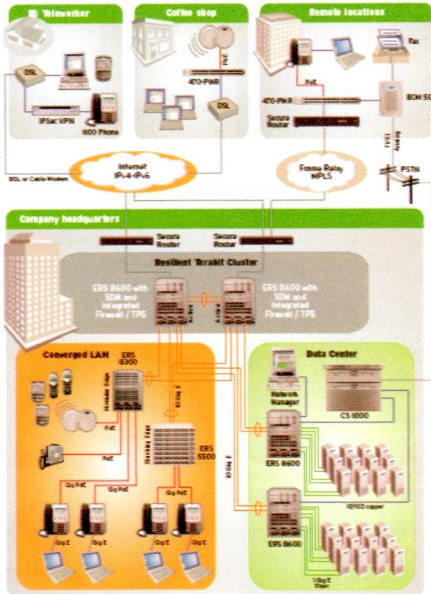
Enterprises

- medium to large campus networks
 - Layer 3 core
 - Layers 2 and 3 distribution
- large enterprise metropolitan networks
 - metropolitan inter-campus connectivity
- real-time and streaming application infrastructure
- IP multicasting infrastructure

- Internet telephony infrastructure
- enterprise wiring closets requiring high-

density edge switching capacity

Network Diagram



Key Points

- **Resilient Switch Cluster:** By supporting Nortel unique resiliency technologies (SMLT and RSMST) over 10 Gigabit Ethernet links you can scale applications like VoIP, ERP, and CRM network-wide with confidence.
- **Secure Switch Cluster:** Integrated security services including firewalls, filtering, and per-port security supply end-to-end safe transport for all types of application data including CRM, ERP, and VoIP.
- **Scalable Switch Cluster:** 720 Gigabit architecture for terabit performance is delivered in resilient clusters for performance available network wide. Proven in third Party test to support 44 10 Gigabit Ethernet uplinks.
- **Cost-Effective Switch Cluster:** The ability to provide subsecond failover across the entire network allows you to use all of your

network resources to their maximum potential.

- **Convergence Ready Out of the Box:** With a large array of filtering, queuing, and traffic-shaping mechanisms, the Ethernet Routing Switch 8600 delivers a network-wide Quality of Experience (QoE) for applications and users alike.
- **Integrated security:** With support for thousands of access control lists and built-in firewalls, support exists for end-to-end data integrity and control.
- **Line rate 10 Gigabit Ethernet:** Programmable packet processors ensure a low cost of ownership over time.
- **15 000 independent hardware queues:** Independent queues on each system supply granular traffic control.
- **Line rate forwarding:** All 10 Gigabit Ethernet interfaces mean no dropped voice or video calls.

- **Half a million route entries:** Full Internet route support provides scalability in routing applications.
- **240 nonblocking Gigabit Ethernet ports**
- **24 nonblocking 10 Gigabit Ethernet ports**
- **With a high-performance flexible solution, you can:**
 - Use the network as a competitive advantage for your company.
 - Drive business innovation from within your organization.
 - Improve customer satisfaction with integrated Web applications.
 - Ensure data integrity and security for traffic on your network.
- **Security:** Support exists for wire-speed security filtering, user authentication, built-in firewall capabilities, and 802.1x EAP.

Features and Benefits

Feature	Benefit
Modular solution	Chassis-based solution with a variety of I/O modules for the wiring closet, enterprise network core, metro edge or metro Ethernet core delivers flexibility and simplifies design, sparing, training, and operations
3-, 6- or 10-slot chassis, 10-slot central office chassis	Flexible solution series deployed to meet a variety of different needs and grow with a business network
Layer 2 through Layer 7 switching, routing and traffic classification	Powerful Ethernet- and Web-switching capabilities in a single solution simplifies deployment and operations
Wire-speed frame switching, routing and classification	No performance penalty for real-time applications that demand quality of service, even during periods of network congestion
Redundant switch management and switch fabric modules	No single point of failure in the switch control plane
Load-sharing switch fabric modules	No wasted modules idling in standby
Hot swap on all chassis components	Prevents network outages when adding or changing modules
IP addressable and configurable	Simplifies management and operations
Copper and fiber Ethernet, ATM, and PoS support	Flexible deployment options for both enterprise and metropolitan connectivity needs

Market Information

- Better resiliency than competing solutions.
- Allows for greater design simplicity and freedom.
- Single integrated operating system.
- High line card density resulting in lower cost of ownership per card.
- Highest number of queues per port versus the competition.
- Resilient Terabit Cluster design offers Terabit performance.
- Integrated security services including Firewall and Threat Protections Services.

Technical Specifications

	8003 chassis	8006 chassis	8010 chassis	8010CO chassis
Physical Specifications	-	-	-	Rack units (RUs): 20
Height:	26.7 cm (10.5 in.)	40.1 cm (15.8 in.)	58.2 cm (22.9 in.)	88.9 cm (35 in.) 44.1 cm (19 in.)
Width:	47.0 cm (18.5 in.)	44.5 cm (17.5 in.)	44.5 cm (17.5 in.)	48.3 cm (19 in.)
Depth:	50.5 cm (19.9 in.)	50.5 cm (19.9 in.)	50.5 cm (19.9 in.)	60.2 cm (23.7 in.)
Weight:	(empty): 18 kg (40 lb) (loaded): 50 kg (110 lb)	(empty): 22 kg (49 lb) (loaded): 63 kg (140 lb)	(empty): 39 kg (85 lb) (loaded): 102 kg (225 lb)	(empty): 57.6 kg (127 lb) (loaded): 142 kg (315 lb)*
Height:	26.7 cm (10.5 in.)	40.1 cm (15.8 in.)	58.2 cm (22.9 in.)	88.9 cm (35 in.) 44.1 cm (19 in.)
Width:	47.0 cm (18.5 in.)	44.5 cm (17.5 in.)	44.5 cm (17.5 in.)	48.26 cm (19 in.)
Depth:	50.5 cm (19.9 in.)	50.5 cm (19.9 in.)	50.5 cm (19.9 in.)	60.19 cm (23.7 in.)
Weight:	(empty): 18 kg (40 lb) (loaded): 50 kg (110 lb)	(empty): 22 kg (49 lb) (loaded): 63 kg (140 lb)	(empty): 39 kg (85 lb) (loaded): 102 kg (225 lb)	(empty): 57.6 kg (127 lb) (loaded): 142 kg (315 lb)*
Cooling system	Fan trays: 1 fan: 3 per tray Thermal sensor: 1 per fan tray	Fan trays: 1 fan: 8 per tray Thermal sensor: 1 per fan tray	Fan trays: 2 fans: 8 per tray (16 total) Thermal sensor: 1 per fan tray (2 total)	Fan trays: 2 fans: 8 per tray (16 total) Thermal sensor: 1 per fan tray (2 total).
Noise	61 dBA maximum	N/A	N/A	N/A

* including the following components: cable management brackets, power supply filler panels, power supply bezel, fan trays, module filler panels. 86.63 kg (191 lb)

Network protocol and standards compatibility	• 802.3 CSMA/CD Ethernet (ISO/IEC 8802-3) • 802.3i 10 Base-T (ISO/IEC 8802-3) • 802.3u 100 Base-T (ISO/IEC 8802-3) • 802.3z (Gigabit Ethernet 1000 Base-SX and LX) • 802.3ab (Gigabit Ethernet 1000 Base-T 4 pair Cat5 UTP) • 802.1D (MAC bridges/Spanning Tree Protocol) • IEEE 802.3ad Link Aggregation • IEEE 802.1w Rapid Re-convergence Spanning Tree • 802.3x (Flow Control) • 802.1X (EAPOL) • 802.1s Multiple Spanning Tree • IETF RFC 3917 IP Flow Information eXport (IPFIX)
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Ordering Information

For further information, contact your local Nortel representative.

Nortel Ethernet Routing Switch 8660 Service Delivery Module



Overview

The Ethernet Routing Switch 8660 Service Delivery Module (SDM) is a device that hosts network applications and brings firewall and Threat Protection System (TPS) functionality to the Ethernet Routing Switch 8600. The SDM is installed in a spare slot of the Nortel Ethernet Routing Switch 8600. The SDM contains 1, 2, or 4 preinstalled Check Point Firewall-1 NG software or Intrusion Sensors to work with the Nortel Defense Center running Sourcefire Snort-based Intrusion Sensor software, which is an open source network intrusion prevention and detection system using a rule-driven language to combine the benefits of signature, protocol, and anomaly-based inspection methods. The software inspects network traffic and enforces policies. The firewalls perform policy checking for every new request, manage the connection table, and specify rules for handling packets in a session. Similarly, the TPS signature matches packets against known threats and updates the Defense Center or Firewall through its OPSEC interface. The SDM card has four slots used for flexible application modules. The initial offering has configurations for 1 firewall (FW1), 2 firewalls (FW2), or 4 firewalls (FW4) and TPS in the following configurations: 4 Intrusion Sensors (IS) (TPS4), 2 FW and 2 IS (FW-2/TPS-2), and 1 FW and 1 IS (FW-1/TPS-1). Support exists for as many as four fully loaded SDMs in a 10-slot chassis, and two fully loaded SDMs are supported in a 6-slot chassis. A single system image simplifies configuration, software management, and fault handling.

Ideal For

- Nortel Ethernet Routing Switch 8600 customers who want to capitalize on the resiliency of the platform while adding security or other applications to the network core.
- Customers seeking integrated core routing solutions with capabilities beyond routing and load balancing and that provide an integrated solution whether from a security perspective or from an application perspective.
- Medium and large enterprise customers that value high-availability and tightly integrated solutions.

Business Challenges

- Do you need to provide security for resources within your network?
- Do you want to capitalize on your existing Ethernet Routing Switch to provide security services?
- Do you want to implement user-based firewall policies and would you like to add a secure component?
- Do you want to decrease the number of security and networking devices you currently maintain?

Typical Applications

Internal Security: surveys show an increased portion of attacks are launched from within the internal network.

Key Points

- Cost of ownership that capitalizes on existing infrastructures to introduce advanced security services.
- Firewall or other security applications built on the 99.999 percent resiliency of the Ethernet Routing Switch 8600.
- The ability to support multiple services simultaneously on one platform eliminates the need for dedicated devices for different applications.
- Few network devices to manage and maintain.

Features and Benefits

- Check Point Firewall-1 NG software with Application Intelligence
- firewall inspection of traffic entering any port of the Ethernet Routing Switch 8600
- firewall OS consisting of the Nortel SSI software
- Threat Protection System (TPS) Intrusion Sensors integrated into the Service Delivery Module

- Threat Protection System (TPS) Intrusion Sensors uses SourceFire Snort-based Intrusion Sensor software
- multiple management options such as command line interface (CLI), browser-based interface (BBI), configuration management using Nortel JDM, firewall configuration and management using Checkpoint Technologies SmartCenter
- Network Address Translation (NAT)
- advanced user filtering using an Access Control list
- high-performance security and application services in a modular configuration
- available with 1, 2, or 4 firewalls
- four general and security application processors
- 1.2 Gb/s maximum throughput for each slot
- ability to support multiple security functions on a single platform
- maximum number of sessions for each slot is 1 000 000
- maximum number of connections per second for each slot is 10 000

Market Information

The Ethernet Routing Switch 8600 is the only modular Ethernet Routing Switch that offers a modular application solution such as the Ethernet Routing Switch 8660 module. By adding different applications to the same card without additional costs or major configuration changes, customers can lower the cost of ownership associated with the Ethernet Routing Switch 8600 and integrate applications directly into the Ethernet Routing Switch 8600 platform. Other vendor solutions offer only firewall services with no plans to support additional applications. For most vendors, additional applications will require additional slots in the chassis. Nortel is the only core routing switch vendor to provide this functionality within its solution. The diversity of applications, combined with the flexibility of the card, provides a superior solution with the Ethernet Routing Switch 8600.

Technical Specifications

Physical specifications	Height: 3.8 cm (1.5 in.) Width: 39.1 cm (15.4 in.) Depth: 47.0 cm (18.5 in.) Weight: 3.3 kg (7.2 lb)
Number of SDMs per chassis type	8003: 1 8006: 2 8010 and 8010CO: 4
Firewall performance	Throughput: • 300 Mb/s for each iSD/1.2 Gb/s for each SDM Session: • 250 KB per iSD/1 KB for each SDM Connections per minute: • 250 per iSD/10 KB for each SDM
Intrusion sensor performance	Throughput: • 300 Mb/s per iSD/800 Mb/s for each SDM
Supported standards, protocols, and RFCs	• Layer 1 and 2 support is the same as the Nortel Ethernet Routing Switch • Layer 3 through 7 is equivalent to that provided by Check Point • Firewall-1 as supported by the Nortel Switched Firewall appliance
Software compatibility	• Nortel Ethernet Routing Switch 8600 v. 3.7.6.0 and 4.1 • Check Point Firewall-1 R60 (for Firewall) • Sourcefire Snort-based Intrusion Sensor software v.4.5
Mean Time Between Failure (MTBF)	322 059 hours at 25°C (77°F)
Environmental specifications	• Operating temperature: 0°C to 40°C (32°F to 104°F) • Storage temperature: -25°C to 70°C (-13°F to 158°F) • Operating humidity: 85% maximum relative humidity, noncondensing • Storage humidity: 95% maximum relative humidity, noncondensing • Operating altitude: 3024 m (10 000 ft) above sea level • Storage altitude: 3024 m (10 000 ft) above sea level
Hardware (per iSD)	• 933 MHz Pentium III processor with Broadcom 5821 Security coprocessor • 1 GB memory • 80 GB hard disk

Nortel Ethernet Routing Switch 8600 Web Switching Module



Overview

The Nortel Ethernet Routing Switch Web Switching Module (WSM) builds on the carrier-grade reliability and high port density of the Nortel Ethernet Routing Switch 8600. The WSM enables the application switching on any port within the system using sophisticated Layers 4 through 7 processing. It contains many of the capabilities of the award-winning stackable Nortel Application Switches in a modular format that is affordable, scalable, and easy to customize for every user's unique needs. This combination creates a complete, high-capacity, carrier-class switching system of unprecedented scale. Features include enhanced health-checking capabilities, intrusion detection system load balancing, an increase in access filters, and the ability to perform switching based on a combination of multiple Layer 7 attributes among others.

The Nortel WSM has four external Gigabit SX Ethernet or 10/100 Tx ports. A single 10-slot chassis can hold one to six modules. The Nortel Ethernet Routing Switch 8600 that is enabled with a Nortel WSM provides a high-density application-switching platform that can support up to 340 10/100 Mb/s or 116 10/100/1000 Mb/s ports that are Layers 2 through 7 enabled.

Ideal For

The Nortel Ethernet Routing Switch 8600 with a Nortel WSM is ideal for enterprises, hosting and content providers, e-businesses, and service providers that require a high-performance switching solution for IT data centers, server farms, and network and hosting infrastructures. In addition, any business with an existing 8600 can easily turn its current high-density Layer 3 switches into a highly intelligent, content-aware application switch with full carrier-class resilience.

Business Challenges

Any business that builds highly scalable Web or network infrastructures or that requires the ability to intelligently manage and control the flow of data can benefit from this product. Load balancing services on any TCP or UDP port, content switching and bandwidth management, are essential services of Nortel Layers 4 through 7 Switches. In addition, deployment of Layers 4 through 7 switches is the key enabler for value-added services such as caching, SSL offload, high availability, and content routing.

Typical Applications

To provide the intelligence, scalability, resilience, and resource optimization to any network, data center, Web, or application server, the Nortel

WSM offers many applications that can run concurrently on a single switch. These applications include:

- server load balancing
- global server load balancing
- cache redirection
- application redirection (including SSL)
- bandwidth management
- content intelligent load balancing
- firewall load balancing
- high availability
- streaming media load balancing
- intrusion detection load balancing
- wireless load balancing
- VPN load balancing
- domain name service Layer 7 load balancing
- layer 7 deny filtering for network and device protection (Web Switches only)
- denial of service protection
- high-speed filtering and NAT
- application abuse protection

Key Points

- Combines the port capacity and density of the Ethernet Routing Switch 8600 with Nortel content-aware switching technology to turn any existing Layer 2 through 3 Ethernet 8600 platform into an intelligent, content-aware device for Layers 2 through 7 Web switching.

- Provides local and global server load balancing and health checks to optimize existing server infrastructure and to minimize costs.
- Combines load balancing and application redirection with Layer 3 and 4 resilience virtual router redundancy protocol (VRRP) to facilitate improved application availability and a fully redundant Nortel Ethernet Routing Switch 8600.
- Enables firewall and VPN load balancing that can run simultaneously with server load balancing for economical security deployment without bottlenecks.
- Delivers content intelligent switching and true session-level persistence to maximize profitability while minimizing infrastructure impact.
- Enhances security without degrading site performance using content filtering, advanced Layer 4 through 7 Delayed Binding, and industry-leading application support for firewall, VPN, and Intrusion Detection System (IDS) load balancing.
- Meters, controls, and accounts for bandwidth use by client, server farm, virtual service, application, user class, content type, and other traffic classes; and supports guaranteed minimum, metered available, and maximum burst bandwidth rates.
- Integrates with the Nortel Ethernet Routing Switch 8600 to provide network device consolidation and ease of management.
- Supports flexible connectivity to multiple technologies through an array of line cards, including Ethernet 10/100, Gigabit Ethernet, CWDM, ATM and POS to allow for content intelligence regardless of connectivity type.
- Supports unique features to enable new, profitable services such as streaming media, wireless Internet, and intrusion detection system load balancing.
- Provides sophisticated security services such as denial of service and application abuse protection, Layer 7 denial filters, high-speed filtering, and NAT.

Features and Benefits

- high-performance switching
- server, firewall, cache, WAN gateway, virtual private network, wireless application protocol,

real-time streaming protocol, domain name service, and intrusion detection server load balancing

- full inspection of URLs, cookies, and host headers across multiple requests and responses
- TCP, UDP, HTTP, FTP, SSL, SMTP, LDAP, DNS, RADIUS, WAP, RTSP, Telnet and NNTP, and IP server load balancing
- application redirection for any traffic type, including wireless
- persistent connections using multiple Layer 4 through Layer 7 parameters
- comprehensive server health checks for content verification and availability
- Gigabit-class, content-intelligent bandwidth management enables service level agreements (SLA) and use-based services
- bandwidth, link, hash, least connections, maximum connections, and round robin load balancing metrics for unparalleled infrastructure optimization
- full network address translation enables multisite load balancing and traffic redirection
- global server load balancing to distributed servers based on health, user proximity, server weights, and response time
- virtual matrix architecture enables dynamic use of all processors and memory
- complete site redundancy through active-active, active-standby, hot-standby, and stateful failover for high availability
- as many as 256 virtual servers for each module
- as many as 1024 application servers for each module
- as many as 1024 services for each module
- as much as 2 kilobits of packet filtering rules for each port
- as many as 512 000 concurrent Layer 4 through 7 sessions for each module

Market Information

Nortel Ethernet Routing Switch Web Switching Module for the Nortel Ethernet Routing Switch 8600 delivers and enhances many award-winning Nortel Application Switch features. The Nortel WSM capitalizes on the same open system (OS) software platform as Nortel switches that are used across all Nortel content switching products.

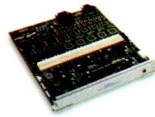
The use of the Nortel Ethernet Routing Switch 8600 allows businesses to benefit from the rich feature set and performance this platform provides. The ability to connect to an array of different technologies allows for content networking and application switching to be

deployed into new areas to provide enhanced network optimization and productivity for enterprises and differentiation for high-end service providers.

Technical Specifications

Components and interfaces	• Four external Gigabit Ethernet or 10/100 Tx ports • Direct interface the Ethernet Routing Switch 8600 backplane • Up to eight Nortel Web Switch Modules for each Ethernet Routing Switch 8600 chassis • Up to 336 10/100 Base-TX with 4 1000 Base-SX front-facing ports • As many as 116 Gigabit Ethernet Ports (112-1000 Base-SX/LX/ XDGBICs ports with 4-1000 Base-SX front-facing Nortel Web Switching Module ports), or 1 to 32 1000 Base-SX Ports
Performance specifications	• Mean Time Between Failure (MTBF) 80 000 hours • Frame Length 9000 (for WSM to WSM traffic) and 1900 through the 8600
Physical dimensions	Height: 3.8 cm (1.5 in.) Width: 3.8 cm (15.4 in.) Depth: 47.0 cm (18.5 in.)
Weight	(single module) approximately 4.5 kg (10 lb)
Environmental specifications	Operating temperature: 5° to 40°C (41° to 104°F) Storage temperature: -25° to 70°C (-13° to 158°F) Operating humidity: 85% maximum relative humidity, noncondensing Storage humidity: 95% maximum relative humidity, noncondensing Operating altitude: 3024 m (10 000 ft) maximum Storage altitude: 3024 m (10 000 ft) maximum Free Fall/Drop: ISO 4180-s, NATA 1A Vibration: IEC 68-2-6/34 Shock/Bump: IEC 68-2-27-29
Processing capacity and performance	10 purpose-built WebICs 20 RISC Processors 80 MB of memory Web switching of 128 Gb/s Wire-speed filtering for more than 48 000 security and policy services Support for more than 4 million concurrent sessions at 2.4 million sessions per second

Nortel Ethernet Routing Switch 8661



Overview

The Nortel Ethernet Routing Switch 8661 is a high-performance secure sockets layer or transport layer security (SSL/TLS) acceleration module that integrates seamlessly into the Nortel Ethernet Routing Switch 8600 Layers 2 through 7 Routing Switch. The Nortel Ethernet Routing Switch 8661 delivers superior SSL offload performance within a resilient chassis-based architecture. The Ethernet Routing Switch 8661 to front-end server farms and enhances secure network environments by removing security operations and encryption and decryption processing from application servers.

The Nortel Ethernet Routing Switch 8661 intelligently accelerates secure business transactions and confidential data by offloading secure sockets layer (SSL) processing from local servers without imposing delays on other network traffic in the same data path. By optimizing SSL processing, the Nortel Ethernet Routing Switch 8661 reduces the number of servers required for a given secure application and mitigates the cost and complexity of installing and managing redundant digital certificates and private keys across servers.

Ideal For

- Any business that needs increased online and application security.
- Organizations that want to provide application switching on secure sessions and communication.
- Businesses with a Nortel Ethernet Routing Switch 8600 that want to build on their infrastructure investments to secure Web-based applications and confidential communications.
- Enterprises that want to secure Web-based applications and transactions using a high-performance SSL accelerator in a resilient chassis-based form factor.
- Medium to large network deployments with high confidentiality or security requirements.
- Health-care operators or finance organizations that must meet strict privacy standards, such as HIPAA or GLBA.
- Hosting service providers offering the SSL Accelerator as a managed service to complement basic facilities and connectivity.

Business Challenges

- Are your applications e-commerce, financial, health care or insurance related?
- Do you have multiple servers processing secure Web sessions? If so, have you noticed performance degradation of your servers?
- Does your company use multiple SSL certificates to authenticate clients accessing

secure Web applications?

- Do you experience difficulties in scaling applications that require encrypted security?
- Do you want to simplify the delivery of a public key infrastructure for your organization?
- Is high availability a concern for your secure applications?
- Do you need "shopping cart persistence" for your SSL transactions?
- Can you benefit from applying leading content-switching techniques to secure sessions and transactions?
- Do you want to improve your server performance and end-user experience while helping to ensure a high level of security for transactions and corporate communications?

Typical Applications

In many e-commerce, e-business or even intranet applications, SSL is enabled on the server to protect sensitive data and transactions. The Nortel Ethernet Routing Switch 8661 helps remove SSL processing from content and application servers, reduces the costs to implement a secure server architecture, and allows application servers to be optimized for their primary roles to serve user transactions.

This module works with the Nortel Ethernet Routing Switch 8600 Layer 2 through 7 Routing Switch that is equipped with a Nortel Web Switching Module (WSM) and is typically placed in front of the server farm.

Network Diagram

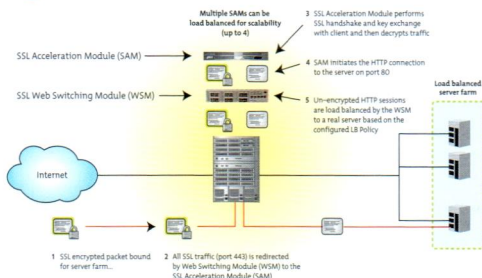


Figure 1 Nortel Ethernet Routing Switch 8661 Session Overview

Key Points

- Industry-leading SSL performance for each module:
 - 3000 SSL transactions per second (TPS), up to 12 000 TPS for each chassis
 - 64 000 concurrent sessions, and up to 256 000 for each chassis
 - 260 Mb/s bulk encryption throughput and up to 1.04 Gb/s for each chassis
- Superior scalability
 - one to four Nortel Ethernet Routing Switch 8661 blades for each 10-slot chassis
 - single system image (SSI) architecture
- Operational simplicity
 - centralized certificate and key management
 - fewer certificates for each domain
- Low cost of ownership
 - easy deployment
 - device consolidation
 - centralized management
 - improved price and performance ratio
- Rock solid reliability
 - multilayered resiliency
- Secure content-based networking
 - perform content networking features on secure sessions
 - maintain persistence connections
 - facilitate advanced security policies

Features and Benefits

- **Industry leading SSL acceleration performance:** the Nortel Ethernet Routing Switch 8661 capitalizes on the award-winning Nortel SSL appliance technology

with purpose-built, application-specific integrated circuits (ASIC) to deliver 3000 TPS, 260 Mb/s and 64 000 concurrent sessions for each blade. The Nortel Ethernet Routing Switch 8661 can process SSL transactions 5 to 50 times faster than a server.

- **Ease of manageability:** the Nortel single system image (SSI) simplifies the deployment of additional SSL Acceleration Modules within a chassis cluster. All configurations, including certificates, are automatically replicated.
- **Secure content networking:** the Nortel Ethernet Routing Switch 8661 enables content networking features on secure sessions including content based load balancing, session persistence, health checking and other Layer 7 services. Facilitates advanced security policies such as virus scanning and intrusion detection on secure traffic.
- **Operational simplicity:** the Nortel Ethernet Routing Switch 8661 delivers unparalleled operational simplicity because it integrates seamlessly into the Nortel Ethernet Routing Switch 8600 architecture and simplifies security management.
- **Comprehensive key and certificate management:** the Nortel Ethernet Routing Switch 8661 supports server certificates, key generation, certificate signing requests (CSR) and certificate revocation lists (CRL).

- **Low cost of ownership:** in addition to the cost savings that result from operational simplicity, the benefit of the Nortel approach is that the Nortel Ethernet Routing Switch 8661 reduces the number of servers and certificates needed, which lowers the cost to manage and maintain a secure communication infrastructure.
- **Rock solid reliability:** Uniting the market-winning and award-winning Nortel SSL technology with the most resilient Layer 2 through 7 routing switches, the Nortel Ethernet Routing Switch 8600 provides for unparalleled reliability for secure communication and business continuity.

Market Information

- Capitalizes on the capabilities of the Nortel SSL Accelerator, which has been the top selling SSL appliance for the last two years according to Infonetics.
- Best-in-class performance and scaling capabilities with up to 12 000 TPS, 1.04 Gb/s bulk encryption rate and 256 000 concurrent sessions per Nortel Ethernet Routing Switch 8600 chassis.
- Single point of administration is truly "best in class," offering unrivalled ease of configuration management and certificates to install a public key infrastructure to have it operational in less than 30 minutes.
- Intelligent traffic management for load balancing on encrypted sessions.

Technical Specifications

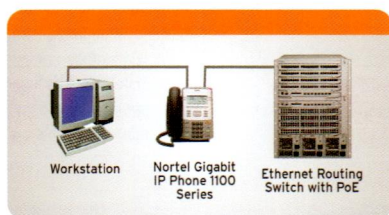
Physical specifications	Height: 3.8 cm (1.5 in.) Width: 39.1 cm (15.4 in.) Depth: 47.0 cm (18.5 in.)
Weight	6.4 kg (14.0 lb)
Electrical specifications	MTBF Rating: 288 615 hours at 25°C (77°F) Input Power: 80 W maximum Operating Temperature: 0° to 40°C (32° to 104°F) Storage Temperature: -40° to 70°C (-40° to 158°F) Maintenance port: 8-pin mini-DIN

Nortel Ethernet Routing Switch 8300 Series



Overview

The Nortel Ethernet Routing Switch 8300 series is the next generation of cost-effective, power over Ethernet (PoE) enabled, modular Ethernet switches. Delivering high-density 10/100/1000 PoE (802.3af) connectivity, high-performance Layer 3 switching, industry-leading resiliency, security and services, the Ethernet Routing Switch 8300 is the solution for enterprises seeking to extend the intelligence of their networks from the network core to the edge.



The Ethernet Routing Switch 8300 series supports open standards such as comprehensive 802.1X/EAP support with enhancements such as Multiple Hosts Multiple Authentications (MHMA), Guest VLAN for Single Host Single Authentication (SHSA), and centralized MAC-based authentication. Supplementing the standards-based approach is the support for the next generation of network access control: Nortel Secure Network Access 4050 release 1.1. This is a Nortel initiative that builds on all of the advantages of third-party authentication and host integrity checking solutions, but delivers this with the added advantages of being clientless and being fully integrated with policy and authorization systems.

The Ethernet Routing Switch 8300 series uses a common operating system base. The tangible business benefit for the customer is that features operate in a consistent manner and reduce configuration and operational costs.

The Ethernet Routing Switch 8300 series is ideal for organizations seeking a high-density 10/100/1000 Power over Ethernet switch with redundant and hot-swappable switch fabrics, I/O modules, and power supplies and support for standards-based PoE (802.3af) to power Gigabit IP phones, Webcams and wireless access points. Nortel Ethernet Routing Switch 8300 series provides guaranteed bandwidth with quality of service (QoS), and secures the network edge with 802.1x (EAPoL) user based authentication, SNMPv3 and RADIUS authentication. Enterprises can extend their network intelligence to the edge, to easily adopt new application models to meet business and users demands.

Ideal For

- medium to large campus networks
- Layer 2 and 3 wiring closets
- Internet telephony infrastructure
- real-time and streaming application infrastructure

- IP multicasting infrastructure
- enterprise wiring closets requiring high-density edge switching capacity
- vertical markets including finance, health care, government, and education

Business Challenges

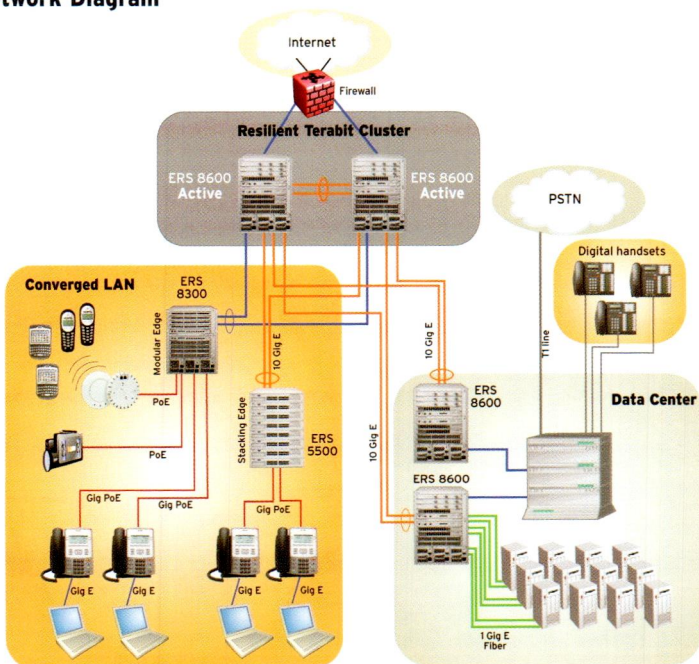
- Is reliability critical to your business?
- Do you plan to upgrade your existing Ethernet network?
- Do you plan to unify your communications onto one network?
- Do you have mission-critical traffic requiring prioritization?
- Do you plan to deploy quality of service?
- Do you plan to deploy Internet telephony?
- Do you plan to deploy streaming audio or video applications?
- Do you plan to deploy desktop-based instruction?
- Do you plan to deploy wireless LAN access points in your network?

- Does the management of converged communications systems, such as IP Telephony, PoE, Gigabit Ethernet to the desktop, high density Ethernet, wireless LANs, and multimedia applications challenge your enterprise?

Typical Applications

- desktop switching
- wiring closet switching with power over Ethernet
- server farm connectivity with high density 10/100/1000 Ethernet connectivity
- medium enterprise or branch office core IP routing
- IP multicasting environments such as surveillance, distance learning, and desktop video conferencing

Network Diagram



Key Points

- **Performance and capacity**
 - 320 Gb/s in the Nortel Ethernet Routing Switch 8300
 - high density 10/100/1000 switch
 - integrated uplinks on switch fabric modules
 - pay-as-you-grow software expansion capabilities
- **Resiliency**
 - redundant and hot swappable switch fabrics, I/O modules and power supplies
 - integrated time delay reflectometer (TDR) for cable plant troubleshooting
 - common code base with Nortel Ethernet Routing Switch 8600
 - designed for split MLT support in future release
- **Security**
 - 802.1x based network authentications
 - SNMPv3 authentication and encryption
 - user-based policies
 - RADIUS authentication
- **Services**
 - QoS with eight queues with traffic policing
 - standard compliant 802.3af power over Ethernet
 - comprehensive network management tools

Features and Benefits

- The 10-slot 8310 chassis is for high-density campus wiring closets and backbones that need the highest levels of availability and scalability.
- The six-slot chassis is for medium-sized, low-density wiring closets and backbones.

Feature	Benefit
Modular solution	One chassis with a variety of I/O modules for the wiring closet, medium enterprise, or branch office network core for flexibility and simplifies design, spare replacement, training and operations
10- or 6-slot chassis	Flexible solution series that can meet a variety of different needs and that grows with the business network
Layer 2 and 3 switching, routing and traffic classification	Powerful Ethernet switching capabilities in a single solution for simplified deployment, operations, and provision of a future proof solution for the business
Wire-speed frame switching, routing and classification	No performance penalty for real-time applications that demand quality of service, even during periods of network congestion
Redundant switch management and switch fabric modules	Reduce single point of failure in the switch control plane
Load-sharing switch fabric modules	Add secondary switch fabric to double the switch throughput with no wasted switch fabrics idling in standby
Hot swap on all chassis components	Prevent network outages when adding or changing modules
IP addressable and configurable	Simplify management and operations

Standards-based 802.3af Power over Ethernet	Flexible deployment of converged communications for power over Ethernet to IP phones, wireless access points, and Webcams
Integrated small form factor pluggable gigabit connectors on switch fabric module	No need to use I/O slots for uplink ports to provide high port density and to maximize investment
Split MultiLink Trunking interoperable	Compatible with split-multilink trunking with Nortel Ethernet Routing Switch 8600 in the network core to provide a highly reliable end-to-end network infrastructure
802.1x (EAPoL) user-based authentication, SNMPv3 and RADIUS authentication	Secure connectivity for enhanced network control
Maximum of 400 ports for each chassis	Cost-effective, high density Gigabit Ethernet to the desktop

- **Switch Management:** Ethernet Routing Switch 8393SF module is optimized for high-performance switching of Layer 2, 3, and 4 traffic. Two switch fabric modules installed in the chassis provide redundant, load sharing capabilities. The module has eight built-in Small Form Factor Pluggable (SFP) Gigabit Ethernet uplinks that provide simple space saving connectivity to the network core. With the two Ethernet Routing Switch 8393SFs installed in a chassis, all 16 SFP ports are active. The switch fabric module also has a console port for out-of-band management.
- **Fast Ethernet with P802.3af Power over Ethernet (PoE):** Ethernet Routing Switch 8348TXPWR module (Figure 2) provides inline power to any IEEE P802.3af compliant devices such as IP phones, wireless access points, net cameras, security, lighting devices, and access control devices. Standards-based equipment means that customers are not bound to any one vendor, as the switch has the flexibility to power multiple vendors P802.3af devices. The module can supply power of up to 15.4 watts for each port, which meets the standard and is sufficient to power most devices.
- **Fast Ethernet:** The Ethernet Routing Switch 8348TX module (Figure 3) provides 48 autosensing 10/100 Mb/s ports for desktop connectivity.

Module and Interface type	Number of Interface Ports	Maximum Number of interfaces per chassis	
		Ethernet Routing Switch 8306 6 Slot Chassis	Ethernet Routing Switch 8310 10 Slot Chassis
8393SF Switch Fabric Module (SFP)	8	16	16
8348TX 10/100 Module (RJ45)	48	192	384
8348TX-PWR 10/100 Module (RJ45)	48	192	384
8324GT10 /100/1000 Module (RJ45)	24	96	192



Figure 1. Ethernet Routing Switch 8300 8393F Fabric Module



Figure 2. Ethernet Routing Switch 8300 8348TX Power Module



Figure 3. Ethernet Routing Switch 8300 8348 TX Module



Figure 4. Ethernet Routing Switch 8300 8324 GT Module

Market Information

- **Backplane:** Nortel Ethernet Routing Switch 8300 has five times more backplane capacity than the Cisco Catalyst 4500.
- **Uplinks:** Nortel Ethernet Routing Switch 8300 switch fabric integrated uplinks can supply 16 Gigabit capacity without installing line cards.
- **Port capacity:** Nortel Ethernet Routing Switch 8300 can provide up to 400 ports in a 10-slot chassis.
- **QoS support:** Nortel Ethernet Routing Switch 8300 has eight queues for proper QoS prioritization versus only four for the competition.
- **VLAN capability:** Nortel Ethernet Routing Switch 8300 systems support 2000 VLANs. Others support much less potentially limiting usability.
- **Power over Ethernet:** Nortel Ethernet Routing Switch 8300 models support standard 802.3af power over Ethernet. Others offer none or a proprietary power scheme.
- **Installation and configuration:** Nortel provides trouble-free installation and configuration.

Technical Specifications

	Ethernet Routing Switch 8306 Series	Ethernet Routing Switch 8310 Series
Physical specifications	Height: 40.1 cm (15.8 in.) Width: 44.5 cm (17.5 in.) Depth: 50.5 cm (19.9 in.) Weight: (Empty) 22 kg (49 lb); (Fully Loaded) 63 kg (140 lb)	Height: 58.2 cm (22.9 in.) Width: 44.5 cm (17.5 in.) Depth: 50.5 cm (19.9 in.) Weight: (Empty) 39 kg (85 lb); (Fully Loaded) 102 kg (225 lb)
Cooling system	Fan Trays: 1 per chassis Fans: 8 per fan tray Thermal Sensors: 1 per fan tray	Fan trays: 2 per chassis Fans: 8 per fan tray Thermal sensors: 1 per fan tray
Operating temperature	0° to 50° C (32° to 104°F) Storage temperature: —25° to 70°C (—13° to 158°F) Operating humidity: 85% maximum relative humidity, noncondensing Storage humidity: 95% maximum relative humidity, noncondensing Operating altitude: 3024 m (10 000 ft) NOM Approved	Operating temperature: 0°C to 50°C (32°F to 104°F) Storage temperature: —25°C to 70°C (—13°F to 158°F) Operating humidity: 85% maximum relative humidity, noncondensing Storage humidity: 95% maximum relative humidity, noncondensing Operating altitude: 3024 m (10 000 ft) maximum Storage altitude: 3024 m (10 000 ft) maximum Free fall/drop: ISO 4180-s, NATA 1A Vibration: IEC 68-2-6/34 Shock/bump: IEC 68-2-27-29
Electromagnetic emissions summary	Meets the following standards US: CFR47, Part 15 Subpart B, Class A Canada: ICES-003, Issue 2, Class A Australia/New Zealand: NZS 3548:1995, Class A Japan: V-3/97.04:1997, Class A Taiwan: CNS 13438, Class A EN55022:1995, Class A EN 61000-3-2:1995 EN 61000-3-3:1994 Electromagnetic immunity: Meets the EN 50082-1:1997 standard	
Performance specifications	Switch fabric bandwidth: 320 Gb/s Addressing: 48-bit MAC address Frame length: 64 to 1518 bytes (IEEE 802.1Q Untagged) 64 to 1522 bytes (IEEE 802.1Q Tagged) Jumbo frame support: Up to 9000 bytes (IEEE 802.1Q Tagged) Data rate: 10 Mbps Manchester encoded or 100 Mb/s 4MB — 5MB encoded MultiLink trunks: Up to 32 trunks with 4 links per group VLANs: Up to 2000 port- or protocol-based; per VLAN Tagging option Multiple spanning tree groups: Up to 64 (STGs)	

Interfaces	Access 48-ports 10/100 Base-T auto-speed sensing 48-ports 10/100 Base-T auto-speed sensing with P802.3af Power over Ethernet 24-port 10 Base-T/100 Base-TX/1000 Base-T Uplinks 8-port Gigabit fiber ports (mini-GBIC slots) 1000 Base-SX uses shortwave length 850 nm fiber optic connectors to connect devices over multimode (550 m or 1805 ft) fiber optic cable 1000 Base-LX uses longwave length 1300 nm fiber optic connectors to connect devices over single mode (5 km or 3.1 mi) or multimode (550 m or 1805 ft) fiber optic cable 1000 Base-T uses Category 5 copper cabling with RJ-45 connectors to connect devices (up to 100 m or 328 ft)
Network protocol and standards compatibility	IEEE 802.3 10 Base-T (ISO/IEC 8802-3, Clause 14) IEEE 802.3u 100 Base-TX (ISO/IEC 8802-3, Clause 25) IEEE 802.3u Autonegotiation on Twisted Pair (ISO/IEC 8802-3, Clause 28) IEEE 802.3x (Flow Control on the Gigabit Uplink port) IEEE 802.3z 1000 Base-SX and 1000 Base-LX IEEE 802.3ab 1000 Base-T IEEE 802.1d MAC Bridges (ISO/IEC 10038) IEEE 802.1p (Prioritizing) IEEE 802.1Q (VLAN Tagging) IEEE 802.1D Spanning Tree Protocol IEEE 802.1ab Station and Media access Control Connectivity Discovery IETF DiffServ
RFC support	RFC 1213 (MIB-II); RFC 1493 (Bridge MIB); RFC 2863 (Interfaces Group MIB); RFC 2665 (Ethernet MIB); RFC 2737 (Entity MIBv2); RFC 2819 (RMON MIB); RFC 1757 (RMON); RFC 1271 (RMON); RFC 1157 (SNMP); RFC 2570 (SNMPv3); RFC 2571 (SNMP Frameworks); RFC 2573 (SNMPv3 Applications); RFC 2574 (SNMPv3 USM); RFC 2575 (SNMPv3 VACM); RFC 2576; RFC 2572 (SNMP Message Processing); RFC 1332/1661 (Point to Point Protocol); RFC791/1812 (Internet Protocol); RFC 1388/2453 (RIP1/ RIP2); RFC 2328(OSPF)†

Nortel Ethernet Routing Switch 1600 Series (1648T/1624G/1612G)



Overview

The Nortel Ethernet Routing Switch 1600 is a fixed port routing switch solution. Wire speed routing and nonblocking switch fabric provide the performance and reliability critical for converged and collaboration applications. Quality of service (QoS) functionality includes support of DSCP and 802.1p as well as four hardware queues for each port. Multilayer flexibility and packet filtering manage resiliency and security. With Release 2.1, ERS1600 series supports Split MultiLink Trunking (SMLT) to resilient small core networks.

The Nortel Ethernet Routing Switch 1600 is available in three models:

- the Nortel Ethernet Routing Switch 1648T with 48 ports of 10/100 plus four connections for small form factor pluggable (SFP) GBICs
- the Nortel Ethernet Routing Switch 1612G with connections for 12 SFP GBICs
- Nortel Ethernet Routing Switch 1624G with connections for 24 SFP GBICs

Ideal For

- small and medium enterprises that require routing performance in a small form factor
- large enterprises that require wire-speed routing in the wiring closet or small network core
- any enterprise organization that plans to implement converged applications (VOIP, multimedia or collaboration) that will require a high-performance solution that incorporates QoS, wire-speed routing and a low-cost entry point

Business Challenges

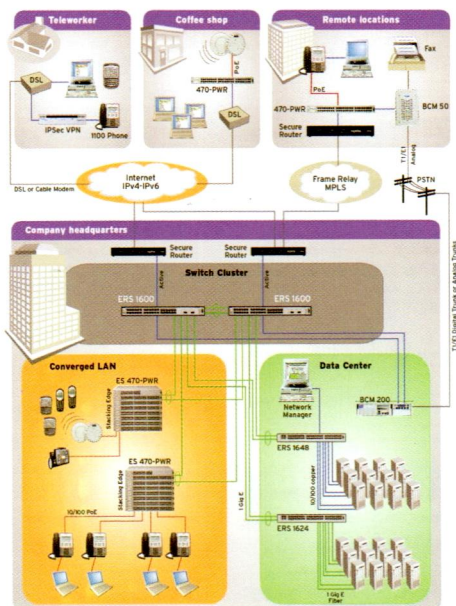
- Do you have minimal dollars to spend on networking infrastructure?
- Are you asked to implement bandwidth sensitive applications like VoIP and e-learning?
- Is more of the traffic on your network revenue-based traffic than ever before?
- Are you being asked to reduce your network operating costs?
- Does your network let your employees be as productive as possible?

Typical Applications

The Nortel Ethernet Routing Switch 1600 is a fixed-port hardware-based routing switch that provides resiliency, performance, and security for converged applications. Resiliency delivers maximum network uptime for critical applications. Application-based performance ensures that data traffic does not drop or delay when the traffic load increases on the switch. Security features provide added protection for all data including IP based voice or revenue-based traffic. The Nortel Ethernet Routing Switch 1600 combines resiliency, performance, and security into a high-performance one rack-unit high solution.

Network Diagram

Nortel Ethernet Routing Switch 1600 Network diagram



Key Points

- **Performance:** nonblocking wire-speed capabilities ensure performance for converged applications.
- **Ease of configuration:** a variety of configuration tools are available, including Nortel Ethernet Switching Element Manager, and Web and SNMP-based applications for error-free graphical and text-based configurations.
- **Interoperability:** support for standard routing and resilience protocols means decreased complexity and time to implement a network core solution.
- **Resiliency:** Technologies such as Split MultiLink Trunking (SMLT), MultiLink Trunking (MLT), virtual router redundancy protocol (VRRP), and IEEE 802.1ad (static) help to ensure maximum availability of resources and down time.

Features and Benefits

- reliability for the network core and wiring closet
 - redundant power supplies
 - Split MultiLink Trunking (SMLT) and MultiLink Trunking (MLT)
 - multilayer resiliency helps to ensure network stability for converged applications
- application-based performance
 - QoS support with DSCP and 802.1p
 - wire-speed routing and nonblocking switch fabric
 - policing and shaping
- security of data
 - packet filtering
 - multilevel access and access policies
 - RADIUS and SSH support
 - SNMPv3
- **Resiliency:** Nortel Ethernet Routing Switch 1600 provides increased network reliability for

starting with the network core and wiring closet. Multilayer support and redundant power supplies ensure maximum availability that is critical for converged and collaborative applications. Support for SMLT and MLT provides redundant load sharing connections to one or more desktop switches. Resiliency is addressed at multiple layers across the entire network to help ensure maximum availability of resources and the lowest down time.

- **Performance:** wire-speed routing and QoS mechanisms deliver the performance required for converged and collaborative applications. A nonblocking switch fabric and hardware-based routing ensure that data does not drop when the traffic load increases on the switch. The policing and shaping features permit traffic flows to be controlled based on applications needs. With support for 48 10/100 ports or up to 24 GBIC ports application performance is available anywhere in the network.
- **Security:** packet filters, support for SNMPv3, and SSH supply added protection for sensitive

data including VoIP conversations. Multilevel access and defined access policies help secure the switch against unauthorized management access. Packet filtering provides an additional way to segment and secure sensitive traffic or network access. Support for RADIUS and SSH give organizations the freedom to use current security databases.

Market Information

As competition in the marketplace intensifies, increased pressure exists for networks to support additional applications. The ability for a network to adapt and perform becomes highly critical. Core network routing represents an area where technology must deliver a lot in the way of performance and resiliency. The Nortel Ethernet Routing Switch 1600 meets these challenges head on by combining resiliency, performance, and security into a high-performance one rack-unit high solution. With this addition to the Ethernet Switch Portfolio, Nortel continues its position as a complete "end-to-end" enterprise solution company.

Technical Specifications

Ethernet Routing Switch 1600 Series	
Physical specifications	Height: 4.4 cm (1.73 in.) Width: 43.9 cm (17.3 in.) Depth: 36.6 cm (14.4 in.) Weight: 1648T module: 5.5 kg (12 lb) 1624G module: 6.1 kg (13.4 lb) 1612G module: 5 kg (11 lb)
Performance specifications	1648T Nonblocking Switch Fabric of 24 Gb/s providing 13 Mpps 1612G Nonblocking Switch Fabric of 24 Gb/s providing 18 Mpps 1624G Nonblocking Switch Fabric of 48 Gb/s providing 36 Mpps
Data rate	10 Mb/s Manchester encoded or 100 Mb/s 4 B/5 B encoded
Interface options	10 Base-T/100 Base-TX: RJ-45 (8-pin modular) connectors for MDI X interface autosensing/autonegotiating SFP (mini) GBICs
Network Protocol and Standards compatibility	• IEEE 802.3 10 Base-T Ethernet (twisted-pair copper) • IEEE 802.3z Gigabit Ethernet • IEEE 802.3u 100 Base-TX Fast Ethernet (twisted-pair copper) • ANSI/IEEE 802.3 Auto-negotiation • IEEE 802.3x Flow Control • IEEE 802.1p Priority Queues • IEEE 802.1Q VLANs • IEEE 802.1d Spanning Tree • 802.1v protocol/IP subnet-based VLANs

RFC support	• RFC 768 Unreliable Data gram Protocol (UDP) • RFC 783 Trivial File Transfer Protocol (TFTP) • RFC 791/950 Internet Protocol (IP) • RFC 792 Internet Control Message Protocol (ICMP) • RFC 826 Address Resolution Protocol (ARP) • RFC 854 Telnet • RFC 2236 Internet Group Management Protocol (IGMP) version 2 • RFC 1542 BOOTP • RFC 1058 Routing Information Protocol (RIP) • RFC 1519 Classless Inter-domain Routing (CIDR) • RFC 1723 Routing Information Protocol (RIP) version 2 • RFC 1724 RIPv2 MIB • RFC 1583 OSPFv2 • RFC 1850 OSPFv2 MIB • RFC 2131 BOOTP/DHCP relay • draft-ietf-idmr-dvmrp-v3-10 DVMRPv3 • RFC 2338 Virtual Router Redundancy Protocol
Electrical specifications	• Power supply ac 100-240V, 50-60Hz, 1.5A maximum • 1+1 Redundant Mean Time Between Failure • 1612 G: 177 000 hours • 1624 G: 158 000 hours • 1648 T: 153 000 hours
Environmental	• Operation temperature: 0° to 40°C (32° to 104°F) • Humidity: 5% to 95% • 3 built-in 40x40x10 mm fans
Safety Agency approvals	• International: IEC 60950 CB Certification • European: EN 60950 Certification • U.S.: UL60950 Certification • Canadian: CSA22.2, #60950 Certification • NOM Mexican Certification
Electromagnetic emissions summary	• International: CISPR22, Class A/CISPR24 Certification • European: EN55022, Class A/EN55024 • U.S.: FCC, Part 15, Class A Certification • Canadian: ICES-003, Class A Certification • Australian/New Zealand: AN/NZS 3548 Certification • Taiwan: BSMI - CNS 13438, Class A • Korea: MIC - MIC, No. 2001-116 • Japanese: VCCI Certification
Electromagnetic immunity	• EN55024 :1998

Nortel Ethernet Routing Switch 1424T



Overview

The Nortel Ethernet Routing Switch 1424T is a performance-based fixed-port routing switch solution that delivers enhanced network performance, simplicity, and flexibility required by today's converged and collaboration applications and solutions. The Nortel Ethernet Routing Switch 1424T improves application performance by enabling better bandwidth use and enhancing network performance. Simple to install and maintain, the Nortel Ethernet Routing Switch 1424T combines network core routing features with wiring closet efficiency. Twenty-four 10/100 ports and two GBIC slots combine to provide connectivity for workgroups, servers, and switches in a 1U high solution. Support for quality of service (QoS) and IP multicast further enhance network application performance and response times. Network redundancy is maintained with MultiLink Trunking (MLT) support, which allows the Nortel Ethernet Routing Switch 1424T to function as a member of a resilient converged solution. The Nortel Ethernet Routing Switch 1424T provides the performance, simplicity, and flexibility that allow enterprises to plan and implement converged networks.

Ideal For

- small to medium enterprises that want a low cost, high-performance fixed-port routing switch for desktop access or aggregation in the network core
- large enterprises that require intelligent routed connectivity for server farms, aggregation points from wiring closets, or core routing for smaller remote offices
- any enterprise organization that plans to implement converged applications (VOIP, multimedia or collaboration) that will require a high performance solution that incorporates QoS, wire-speed routing and a low-cost entry point

Business Challenges

- Are you implementing converged applications?
- Can your users be more productive?
- Do your users experience slow application and response time?
- Do your users suffer from slow server or application access?
- Do you want an aggregation or core switch that is easy to install and use?
- Do you have multiple, distant offices (up to 70 km) that need to share resources?
- Are you concerned about cost of purchasing switches?
- Do you want gigabit performance without investing in a chassis-based switch?

- Do you expect your business and the associated traffic in your network to grow within the next three to six months?

Typical Applications

Ethernet Routing Switch 1424T is suited for any enterprise that wants to:

- increase application performance for mission-critical solutions
- enhance network bandwidth use
- simplify SNMP and Web management and installation

Key Points

- built-in support for converged applications
- wire-speed routing
- nonblocking architecture
- four hardware priority queues; 802.1p and diffServ
- SNMP and Web management
- packet filtering
- VLAN support
- autopolarity and autosensing
- GBIC support
- multiple Gigabit fiber uplink ports
- MLT support

Features and Benefits

The Nortel Ethernet Routing Switch 1424T features 24 ports of 10/100 Ethernet and two GBIC slots (GBICs are ordered separately). Wire-speed routing and a nonblocking architecture provide the performance required by today's

converged applications. For applications with stringent network requirements, four priority queues with support for 802.1p and diffServ, provide QoS within the network. Reliability is maintained with MLT support, where a Nortel Ethernet Routing Switch 1424T functions as an edge member of a resilient core solution. SNMP and Web management increase reliability and simplicity by providing a simple way to configure and monitor the switch.

- **Performance:** Nortel Ethernet Routing Switch 1424T provides increased application performance by improving bandwidth use and enhancing network performance. The addition of QoS and performance based routing to a network helps decrease latency and jitter. QoS implemented at the network edge allows traffic to be marked as close to the application as possible, which enables better use of the network backbone.
- **Simplicity:** Nortel Ethernet Routing Switch 1424T is simple to use and maintain. With both Web-based and SNMP management, the Nortel Ethernet Routing Switch 1424T can be configured quickly with fewer errors than competing products. Fewer errors enable fast implementation times and minimal problems to troubleshoot. The ability

of the Nortel Ethernet Routing Switch 1424T to classify traffic at the network edge allows network administrators to set policies based on traffic type to help ensure that applications that have special bandwidth requirements get the required bandwidth.

- **Flexibility:** with 24 10/100 ports and 2 GBIC slots, the Nortel Ethernet Routing Switch 1424T provides enhanced connectivity for workgroups and servers. The GBIC ports allow for connectivity of single and multimode fiber for both SX and LX connectivity. Multilayer redundancy is delivered by MLT capabilities that provide multiple ports acting as one trunk and the ability to participate in an SMLT solution.

Market Information

The Ethernet Routing Switch 1424T delivers performance to the wiring closet. As a desktop routing switch, the 1424T routing switch provides the performance, simplicity, and flexibility required by today's applications-focused network. As competition in the global marketplace fuels the growth for network applications, Nortel continues to be in a unique position to provide customers with the broadest range of solutions to help ensure the success of their businesses.

Technical Specifications

Ethernet Routing Switch 1424T

Physical Specification	Height: 4.3 cm (1.7 in.) Width: 43.9 cm (17.3 in.) Depth: 20.32 cm (8.0 in.) Weight: 2.8 kg (6.2 lb)
Performance Specifications	Frame forwarding rate (64 byte packets): • 8.8 Gb/s switching fabric capacity • 6.6 Mp/s packet forwarding rate Port forwarding performance (64 byte packets): • 8.8 Gb/s switching fabric capacity • 6.6 Mp/s packet forwarding rate Port filtering performance (64 byte packets): • Address database size: 8000 kbits • Addressing Frame length: Up to 1536 bytes
Data Rate	10 Mb/s Manchester encoded or 100 Mb/s 4 MB/5 MB encoded

Interface Options	10 Base-T/100Base-TX: RJ-45 (8-pin modular) connectors for MDI-X interface GBICs: 2-port GBIC-based Gigabit Ethernet Module The 1424T GBIC MDA supports the following GBICs: • 1000 Base-SX uses shortwave 850 nm fiber optic connectors to connect devices over multi-mode (550 m or 1805 ft.) fiber optic cable. • 1000 Base-LX uses longwave 1300 nm fiber optic connectors to connect devices over single mode (5 km or 3.1 mi) or multi-mode (550 m or 1805 ft) fiber optic cable. • 1000 Base-XD uses longwave 1550 nm fiber optic connectors to connect devices over single-mode (up to 50 km or 31 mi) fiber optic cable • 1000 Base-ZX uses longwave 1550 nm fiber optic connectors to connect devices over single-mode (up to 70 km or 43 mi) fiber optic cable • 1000 Base-T uses RJ-45 connectors to connect devices over category 5 copper cabling (up to 100 m or 328 ft)
Network Protocol and Standards Compatibility	• IEEE802.3 10 Base-T Ethernet (twisted-pair copper) • IEEE802.3u 100 Base-TX Fast Ethernet (twisted-pair copper) • ANSI/IEEE802.3 Auto-negotiation • IEEE802.3x Flow Control • IEEE802.1p Priority Queues • IEEE802.1q VLANs • IEEE802.1D Spanning Tree
RFC Support	• RFC 768 User Data gram Protocol (UDP) • RFC 783 Trivial File Transfer Protocol (TFTP) • RFC 791 / 950 Internet Protocol (IP) • RFC 792 Internet Control Message Protocol (ICMP) • RFC 826 Address Resolution Protocol (ARP) • RFC 854 Telnet • RFC 2236 Internet Group Management Protocol (IGMP) version 2 • RFC 1542 BOOTP • RFC 1058 Routing Information Protocol (RIP) • RFC 1519 Classless Inter-domain Routing (CIDR) • RFC 1723 Routing Information Protocol (RIP) version 2 • RFC 1724 RIPv2 MIB • RFC 1583 OSPFv2 • RFC 1850 OSPFv2 MIB • RFC 2131 BOOTP/DHCP relay • draft-ietf-idmr-dvmrp-v3-10 DVMRPv3
Electrical Specifications	Power supply: 100 - 240 V ac, 50-60 Hz internal universal
Environmental	Operating Temperature: 0° to 50°C (32° to 122°F) Storage temperature: -25° to 55°C (-13° to 131°F) Humidity: 5% - 95% noncondensing
Safety Agency Approvals	CUS, TUV, CB, NOM
Electromagnetic Emissions Summary	• FCC Class A • CE Mark • VCCI Class • I BSM
Electromagnetic immunity	EN55024 :1998

Nortel Ethernet Routing Switch Redundant Power Supply 15



Overview

The Nortel Ethernet Routing Switch Redundant Power Supply (RPS) 15 is a low-cost yet scalable redundant power supply device that provides redundancy and power protection in a single chassis for stackable Nortel Ethernet Routing Switches and Ethernet Switches. The RPS 15 maintains network operation in case of device power failure. The RPS applies power to the switches simultaneously without rebooting the device. During normal operation, the RPS loadshares with the power supply in the network device to increase the life expectancy of the power supply. The power redundancy modules are hot-swappable so additional protection can be added within normal office hours and without network down time. With the modular chassis, you can acquire additional RPS modules as your network grows.

The RPS 15 provides power sharing or protection for Nortel Ethernet Routing Switch 5520, as well as power protection for non-PoE switches. As many as 12 switches can be power-protected with one RPS 15 to provide maximum efficiency. For additional resiliency, customers can choose an Uninterruptible Power Supply (UPS) solution from an approved vendor.

The RPS 15 is a two-rack unit high design that accommodates up to three Redundant Power Supply (RPS) modules. Each RPS module can deliver up to 600 W of power. The RPS module features two front-facing LED indicators to display the status of ac and dc power. The basic configuration consists of an RPS chassis that is shipped with two preinstalled blank panels. The RPS 15 requires at least one RPS Module that you must order separately. Additionally, you need to order a dc power cable to connect to the dc power socket of the switch. Depending on the switch type, a separate dc-to-dc converter can be necessary.

Power Protection Mode

The RPS 15 provides power protection for Ethernet Routing Switches 5510, 5520, and 5530, Ethernet Switch 470, as well as Ethernet Services Unit 1400, 1450, and 1800. Each 600 W RPS module can supply power to one 5520 Switch, one 5530 Switch, or four 5510, 470, or Ethernet Services unit models. In case of a power outage, the RPS 15 immediately takes over to provide power to the switch. In power-protection mode, the RPS 15 can provide 320 W to Power over Ethernet (PoE) devices such as 5520 Switches in the network to a maximum of 15.4 W per port (13.3 W average to 24 ports and 6.6 W average to 48 ports).

Power Sharing Mode

To increase port PoE power, power sharing is available when the RPS 15 is used with the internal power supply for the Nortel Ethernet Routing Switch 5520 series. These switches can be configured to use an internal or external power source only to provide power redundancy. In this case, 320 W of power can be provided to connected devices with a maximum of 15.4 W for each port according to the standard requirement. When configured to use both internal and external power (power sharing) the switch total PoE power output is increased to 740 watts. In power sharing mode, as many as 740 W (conform 802.3af, 15.4 W per port on a -48T) is provided.

Ideal For

- New and existing mid-tier and enterprise customers that need RPS functionality.
- Enterprise customers that need more power for PoE devices than a single switch can deliver.
- Enterprise customers that already have a UPS and need only power redundancy.
- Enterprise customers that need power redundancy but have limited space in the wiring closet.

Business Challenges

- Is network uptime and uninterrupted activity critical to your business?
- Do you have multiple wiring closet switches?
- Is space limited in your wiring closets?
- Do you have multiple high-demand PoE devices connected to your wiring closet?

Typical Applications

- **5520 switches:** using a single chassis, connect up to three 5520 switches and provide each switch with 320 W for Power over Ethernet Redundancy or 720 W in power-sharing mode. Order a dc cable (AA0005018) to connect each 5520 switch.
- **5530 switch:** using a single chassis, connect up to three 5530 switches. Order a dc cable (AA0005018) to connect each 5520 switch.
- **Other switches:** Using a single chassis, connect up to 12 Ethernet Routing Switch 5510, Ethernet Switch 470, as well as Ethernet Services units 1400, 1450, and 1800 to provide power protection. A chassis accepts up to three 600 W RPS modules. Each RPS module can protect up to four switches. Each RPS module uses a dc cable (13 m or 10 ft) to connect up to four switches. For maximum deployment flexibility a longer dc cable (7.6 m or 25 ft) is also available. Models 5510 and 470 also need a dc-to-dc connector, which is purchased separately.

Features and Benefits

- Provides power redundancy to power supplies of Ethernet Routing Switches 5510, 5520, 5530, Ethernet Switch 470, as well as Ethernet Services Unit 1400, 1450, and 1800.
- Single chassis, two rack-units high for standard 19-inch rack compact packaging provides a scalable, redundant power supply for multiple devices.
- Redundant Power Supply (RPS) modules available in 600 W rating to provide redundant direct current power for as many as 12 devices for each chassis.
- Separately purchase redundant power modules and install them into the chassis, as needed, while the unit is operational.
- Provides load sharing to PoE switches such as the Ethernet Routing Switch 5520. Each port can deliver a full 15.4 W of power.
- Protects mission-critical enterprise applications from interruption due to problems with either the power source or the power units within network devices.
- Replace or add hot-swappable RPS modules while the entire unit is operational.
- With the help of a third-party UPS solution, the RPS 15 helps to ensure continuity of ac power to switches and other network devices even during the failure of ac mains, power sags, surges, or blackouts.

Technical Specifications

Interfaces	Standard ac wall plug - NEMA 5-15 P (ac in) dc connector
Electromagnetic compatibility	• EN55022/CISPR 22 • Class A, EN55024/CISPR 22 • Japan: Class A, VCCI, Class A • Taiwan: BSMI Class A • Australia/New Zealand: ACA, 3548 • Australia: Class A • U.S.: FCC Part 15 Class A
MTBF	>2 000 000 hours
Noise level	<60 dBA
Shock and vibration	• NEBS GR-63 Standard • MIL-STD-810E • METHOD 516.4, procedure IV when packaged for shipping. • NEBS GR-63-CORE Sect. 5.3.1, Category A container • NEBS GR-63-CORE, Sect. 5.1.1 • NEBS GR-63-CORE, Sect. 5.4.3
Physical dimensions	Height: 7.93 cm (3.125 in.) Width: 34.93 cm (13.75 in.) Depth: 13.65 cm (5.375 in.) Weight: chassis 6.8 kg (15 lb) RPS module: 3.4 kg (7.5 lb)
Power requirements	Input requirements: Input voltage: 90-264 V ac Input frequency range: 47 to 440 Hz Nominal: 50 / 60 Hz Inrush current: max. 40 A Leakage current: 0.5 mA to 3.0 mA maximum for any input voltage Output requirements: Output voltage and current 600 W power supply module dc output: 47.5 V output, 600 W, Minimum Load: 0A, Full Load: 12.5 A
Environmental	Operating temperature: 0° to 40°C (32° to 104°F) Storage temperature: -25° to 70°C (-13° to 158°F) Operating relative humidity: 5% to 85% relative humidity, noncondensing Storage temperature humidity: 95% maximum relative humidity, noncondensing Operating altitude: Up to 3024 m (10 000 ft) above sea level Storage altitude: Up to 9144 m (30 000 ft) above sea level Cooling, forced air: 2x30 CFM, 80 mm fans
Standards and certifications	• UL 1778 • UL/C-UL 1950 • IEC 950/EN 60950 • EN50091-1, CB certificate and report with all national deviations • TCAAS/NZS 3260 • CCIB/GB4943 • GB9254 • KNITQ • JET • PSB • NOM-019-SCFI • GOST • IRAM

Ordering Information

For further information, contact your local Nortel representative.

Nortel Ethernet Routing Switch 3510-24T

Overview

Nortel Ethernet Routing Switch 3510-24T is a stand-alone 24-port 10/100/1000 Mb/s Layer 3 Ethernet switch designed for small and medium businesses and branch offices that want a cost-effective, high-performance desktop switching solution. It offers 24 10/100/1000 Mb/s autosensing ports with four Small Form factor Pluggable (SFP) uplink ports for fiber connection. The 3510-24T delivers a highly affordable LAN solution that offers high performance, is easy to use, and delivers investment protection.

Ideal For

Small and medium businesses (SMBs) and branch offices of enterprises as well as server farms.

Business Challenges

Are price and performance predominant decision factors?

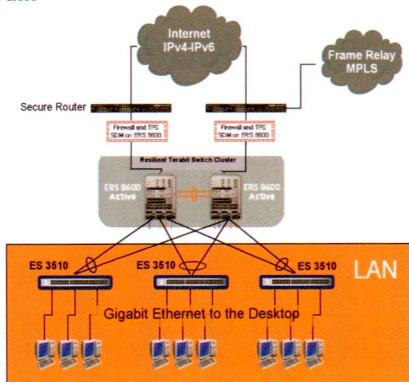
Typical Applications

Any customer looking to:

- improve employee productivity using Gigabit to the desktop

- implement cost-effective Gigabit desktop connectivity
- high-performance for graphics and multimedia applications
- simplify management and installation using Web management
- aggregate servers
- protect investments

Network Diagram



Key Points

- Cost-effective Gigabit desktop connectivity helps improve employee productivity.
- Easy-to-use management features save time.
- Gigabit performance improves performance quality and provides investment protection.
- Layer 3 routing helps improve network performance.
- QoS support for time-sensitive, mission-critical applications including Voice over IP and multimedia applications.
- Uses existing Category 5 copper cabling.
- Is worry-free with lifetime warranty.

Features and Benefits

- **Gigabit desktop connectivity:** 24 10/100/1000 autosensing ports. Gigabit performance improves employee productivity by accelerating data transfer of large file sizes such as graphics and multimedia. Gigabit performance is designed to future-proof investment by accommodating the ever-growing bandwidth and low delay requirements to end users running critical business applications.
- **Low 10/100/1000 per-port price:** saves costs while deploying high-speed data network.
- **Layer 3 routing:** helps improve network performance as packets do not pass through the network core and routing can take place within the switch.

- **Wire-speed operation:** helps to ensure no dropped packets.
- **Java Device Manager and Web-based management:** graphical user interface minimizes the time needed to configure and manage the switches.
- **Command Line Interface (CLI) and ASCII Configuration:** helps automate general management and configuration, which makes it ideal for enterprise branch office applications.
- **Eight hardware queues for QoS:** helps provide high granularity of traffic control for mission critical applications.
- **Secure access:** helps prevent unauthorized user access.

Market Information

The Nortel Ethernet Routing Switch 3510-24T is a cost-effective high-performance 10/100/1000 Mb/s Layer 3 routing switch featuring high-speed uplinks, easy configuration, and Web-based management from your Web browser. It meets the requirements of small and medium businesses and branch offices that consider price and performance to be key decision factors. The switch can accommodate the ever-growing bandwidth and low delay requirements to end users running critical business applications and they can now take full performance advantage of PCs, laptops, and servers that are gigabit-enabled.

Technical Specifications

Ethernet Routing Switch 3510-24T	
Physical specifications	Height: 4.45 cm (1.75 in.) Width: 43.82 cm (17.25 in.) Depth: 20.80 cm (8.19 in.) Weight: 4.5 kg (9.9 lb)
Performance specification	Switch fabric bandwidth: 80 Gb/s for the switch Frame forwarding rate: 35.7 Mp/s (million packets per second)
Port forwarding and filtering performance	For 10 Mb/s: 14 880 p/s maximum (64-byte packets) For 100 Mb/s: 148 810 p/s maximum For 1000 Mb/s: 1 488 100 p/s maximum Address database size: 8000 entries at line rate (8000 entries without flooding) Addressing: 48-bit MAC address Frame length: 64 to 1518 bytes (IEEE 802.1Q Untagged) 64 to 1522 bytes (IEEE 802.1Q Tagged) Jumbo frame support: Up to 9216 bytes Multi-Link Trunks: Six trunks, four members per trunk VLANs: 256 port-based or protocol-based VLANs Tagging option Multiple Spanning Tree Groups: Up to eight STGs
Interface options	10 Base-T/100 Base-TX/ RJ-45 (8-pin modular) connectors for Auto MDI/MDI-X interface 1000 Base-T with autopolarity
SFP GBIC support	1000 Base-SX: Uses short wavelength 850 nm MTRJ or LC type fiber optic connectors to connect devices over multimode (275 m [902.2 ft], 62.5 um core or 350 m [1148.3 ft], 50.0 um core) fiber optic cable 1000 Base-LX: Uses long wavelength 1300 nm duplex LC type fiber optic connector to connect devices over single mode (10 km [6.2 mi], 9 um core) fiber optic cable 1000 Base-CWDM: Uses long wavelength 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610 nm LC type fiber optic connector to connect devices over single mode (40 km [24.9 mi], 9 um core or 70 km [43.5 mi], 9 um core) fiber optic cable
Network Protocol and Standards compatibility	IEEE 802.3 10 Base-T (ISO/IEC 8802 3, Clause 14) IEEE 802.3u 100 Base-TX (ISO/IEC 8802-3, Clause 25) IEEE 802.3u Autonegotiation on Twisted Pair (ISO/IEC 8802-3, Clause 28) IEEE 802.3x (Flow Control on the Gigabit Uplink port) IEEE 802.3z 1000 Base-SX and 1000 Base-LX IEEE 802.1d MAC Bridges (ISO/IEC 10038) IEEE 802.1p (Prioritizing) IEEE 802.1Q (VLAN Tagging) IEEE 802.1D Spanning Tree Protocol IEEE 802.3ad (manual/static) IEEE 802.3ad (LACP)† IEEE 802.1s† IEEE 802.1w† IETF DiffServ † Future software release

RFC support	RFC 1213 (MIB-II); RFC 1493 (Bridge MIB); RFC 1573 (IF-MIB); RFC 2863 (Interfaces Group MIB); RFC 2665 (Ethernet MIB); RFC 2737 (Entity MIBv2); RFC 2819 (RMON MIB); RFC 1757 (RMON); RFC 1271 (RMON); RFC 1157 (SNMP); RFC 2570 (SNMPv3); RFC 2571 (SNMP Frameworks); RFC 2573 (SNMPv3 Applications); RFC 2574 (SNMPv3 USM); RFC 2575 (SNMPv3 VACM); RFC 2576 (SNMPv3); RFC 2572 (SNMP Message Processing) RFC 791 (IP); RFC 792 (ICMP); RFC 793 (TCP); RFC 783 (TFTP); RFC 826 (ARP); RFC 768 (UDP); RFC 854 (TELNET); RFC951 (Bootp); RFC 2236 (IGMPv2); RFC 1112 (IGMPv1); RFC 1945 (HTTP v1.0); RFC 2138 (RADIUS); RFC 894 (IP over Ethernet); RFC2674 (Q MIB); RFC 1058/RFC 1723 (RIPv1/v2) †; RFC 2030 (SNTP [Simple NTP]) † Future software release
Electrical specifications	Input voltage (ac version): 100-240 V ac (+/- 10%) at 47 to 63 Hz Input power consumption (ac version): 90 W max Input current (ac version): 0.8 A maximum Input voltage (rms): 100 to 240 V ac at 50 to 60 Hz Maximum thermal output: 310 BTU/hr
Environmental specifications	Operating temperature: 0° to 45°C (32° to 113°F) Storage temperature: -25° to 70°C (-13° to 158°F) Operating humidity: 85% maximum relative humidity, non-condensing Storage humidity: 95% maximum relative humidity, non-condensing Operating altitude: Up to 3024 m (10 000 ft) above sea level Storage altitude: Up to 3024 m (10 000 ft) above sea level
Mean Time Between Failures	335 000 hours
Safety Agency approvals	UL60950 CSA 22.2 No. 60950 (CUL) IEC 60950/EN 60950, CB report and certificate with all national deviations UL-94-V1 flammability requirements for PC board NOM-019 (NOM)
Electromagnetic emissions summary	Meets the following standards: US: CFR47, Part 15, Subpart B, Class A Canada: ICES-003, Issue 3, Class A Australia/New Zealand: AS/NZS 3548:1995, A1:1997/A2:1997 Class A Japan: VCCI-V-3/02.04 Class A Taiwan: CNS 13438, Class A EN55022:1998/A1:2000 EN61000-3-2:2000 EN61000-3-3:1995/A1:2001
Electromagnetic immunity	The module meets the EN55024:1998/A1:2000 standard
Declaration of conformity	As stated in the Declaration of Conformity, the Ethernet Routing Switch 3510 complies with the provisions of Council Directives 89/336/EEC and 73/23/EEC

Nortel Ethernet Routing Switch 5510

Overview

Part of the Nortel Ethernet Routing Switch 5500 series, the Nortel Ethernet Routing Switch 5510, is one rack-unit high stackable 10/100/1000 Mb/s Ethernet Layer 3 switch that provides affordable high-density Gigabit desktop connectivity for medium and large enterprise wiring closets. The Nortel Ethernet Routing Switch 5510 offers a scalable and resilient solution with exceptional security features and support for enhanced convergence while minimizing capital and operational expenses. The Nortel Ethernet Routing Switch 5500 family represents the next-generation in innovation and performance in a stackable solution, while incorporating features to protect an enterprise wiring closet investment.

Ideal For

- enterprises that want affordable long-term investment in the wiring closet
- enterprises that work with large files and want fast file access
- medium to large single-site and multisite enterprises with demanding network needs including high bandwidth, high density, and compact size
- enterprises that require quality of service (QoS) in the local area network
- enterprises that want to implement and support voice, video, and data on the same network

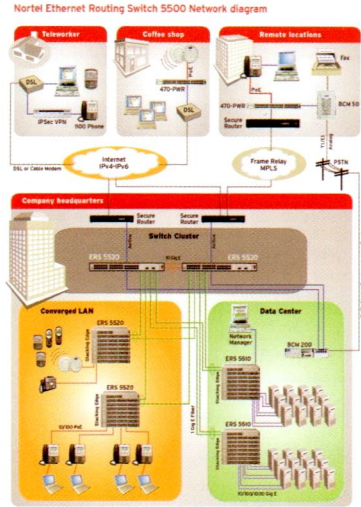
Business Challenges

- Do you want to incorporate your LAN solution in the wiring closet to support you for the next five years?
- Do you want an affordable enterprise-class Gigabit desktop connectivity?
- Do you have limited space available in your wiring closets?
- Do you work with large files?
- Are you tired of long file transfer times?
- Do you plan to use collaborative applications in the future?
- Do you want to minimize network down time?
- Do you require a high level of security at the edge of your network?
- Do you want to set levels of priority for key departments, users or applications?
- Do you plan to implement voice over IP (VoIP), video conferencing, on-line training or video streaming on your network?

Typical Applications

- high-bandwidth requirements such as multimedia (video and application streaming), e-commerce and Web applications
- collaborative peer-to-peer applications such as office automation, grid computing, or instant messaging
- large file transfer applications such as storage, multimedia production and editing, desktop publishing, video training, CAD/CAM, imaging, MRI, X-ray, and telemedicine
- delay-intolerant applications such as IP telephony
- key department or personnel prioritization requirements such as help desk, service teams, or key management

Network Diagram



Key Points

- High-density Gigabit desktop connectivity: up to eight switches can be stacked to achieve up to 384 10/100/1000 ports in a stack. Pay-as-you-grow while saving premium closet space.
- Innovative FAST stack design: Flexible Advanced Stacking Technology (FAST) stack design allows for simultaneous bi-directional traffic flow on each stacking port resulting in up to 640 Gb/s stacking bandwidth for the stack. This is the highest stacking bandwidth in the industry today to allow for faster traffic flow across the stack for bandwidth-intensive applications.
- High-performance switch fabric of 160 Gb/s: wire-speed performance with no dropped packets.
- Ethernet Switch software: flexible stacking across 5510, 5520, and 5530 switches.
- Compact form factor: one rack-unit high design allows a stack to support up to 384 ports and saves premium space in the wiring closet.

Features and Benefits

The Nortel Ethernet Routing Switch 5510 is available in two models:

- the Nortel Ethernet Routing Switch 5510-48T
- the Nortel Ethernet Routing Switch 5510-24T

The Nortel Ethernet Routing Switch 5510-48T features 48 10/100/1000Base-T RJ-45 ports for desktop switching and two built-in small form factor pluggable (SFP) GBIC ports for uplink. Ports 47 and 48 offer configuration flexibility by allowing the network administrator to configure each port as either 10/100/1000 use of the built-in SFP GBIC. You can stack up to eight Nortel Ethernet Routing Switch 5510-48Ts to achieve up to 384 10/100/1000 ports for highest-density desktop switching.

The Nortel Ethernet Routing Switch 5510-24T offers 24 10/100/1000 Base-T RJ-45 ports for desktop switching and two built-in GBIC ports for uplink. Ports 23 and 24 offer configuration flexibility as either a 10/100/1000 or a built-in SFP GBIC port. Both Nortel

Ethernet Routing Switches 5510-24 T and 5510-48 T may be combined in a single stack for maximum flexibility.

- **High-density Gigabit desktop connectivity:** stack up to eight switches to achieve up to 384 10/100/1000 ports in a stack. Pay as you grow while saving premium closet space.
- **Innovative FAST stack design:** Flexible Advanced Stacking Technology (FAST) stack design allows for simultaneous bi-directional traffic flow on each stacking port that results in up to 640 Gb/s stacking bandwidth for the stack — the highest stacking bandwidth in the industry today that allows fast traffic flow across the stack for bandwidth-intensive applications.
- **High-performance switch fabric of 160 Gb/s:** wire-speed performance with no dropped packets.
- **Compact form factor:** one rack unit high design allows a stack to support up to 384 10/100/1000 ports and saves premium space in the wiring closet.
- **Layer 3 routing:** supports dynamic routing features including RIPv1, RIPv2 and OSP, which improves the network performance because routing is achieved at the edge.
- **Resiliency:** technologies such as Split Multilink trunking (SMLT), Distributed MultiLink trunking (DMLT), virtual router redundancy protocol (VRRP), IEEE 802.1s, 802.1w and 802.1ad (static) ensure maximum availability of resources and the lowest down time.
- **Convergence enhancements:** supports 802.1ab and Auto Detect / Auto Config (ADAC) for IP Telephony.
- **Single software image:** allows Ethernet Routing Switch 5510, 5520 and 5530 models to stack together, simplifying software upgrades.
- **Auto Unit replacement feature:** allows for retrieval of the failed switch's configuration from a server on to the replacement switch, saving time and making configuration easier.
- **Higher uplink capacity:** up to 16 GBIC ports are available for uplink connectivity in a full stack for faster data traffic between the stack and the core switches.

- **Fail-safe stacking:** assures continuous uptime for a stack — even if a switch fails — and eliminates a single point of failure.
- **Secure access and data traffic protection:** features include secure shell (SSH), secure sockets layer (SSL), IEEE 802.1x based security, (also known as extensible authentication protocol [EAP]), assignment of proper VLAN and priority, user-based policies and RADIUS authentication. Protection also includes extensive security in the wiring closet. New IEEE 802.1x enhancements include Multiple Host Multiple Authentication (MHMA) adding support for allowing more than one authenticated host per port. Guest VLANs are also included.

Market Information

Performance requirements at the edge of the network become increasingly demanding. IP Telephony and other collaborative applications drive more traffic to the edge of the network. As file sizes continue to grow, users need more bandwidth. The convergence of voice, video, data and storage enables users to do more from the desktop. Enterprises must address today's increased demands and still prepare for the unknown demands of tomorrow. By re-assessing how to use the wiring closet, enterprises can achieve both goals and be assured that their investment are protected over time. Ethernet Routing Switch 5510 provides high-density Gigabit desktop connectivity for medium and large enterprise customers wiring closets. It offers a scalable and resilient solution that provides exceptional security features and support for enhanced convergence while minimizing capital and operational expenses.

Technical Specifications

	Ethernet Routing Switch 5510 series
Physical specification	Height: 4.45 cm (1.75 in.) Width: 43.82 cm (17.25 in.) Depth: 38.74 cm (15.25 in.) Weight: 5.8 kg (12.78 lb) for —24T 6.0 kg (13.2 lb) for —48T
Performance specifications	Switch fabric bandwidth: 160 Gb/s for the switch; up to 1280 Gb/s for the full stack Stacking bandwidth: 80 Gb/s for the switch; up to 640 Gb/s for the full stack Maximum data throughput: 768 Gb/s for a full stack of 5510-48 T Frame forwarding rate: 71.4 Mpp/s (million packets per second) for the Ethernet 5510-48 T and 35.7 Mpp/s for the 5510-24 T; 571.4 Mpp/s for a full stack of 8 5510-48 T units
Port forwarding and filtering performance	For 10 Mpp/s: 14 880 p/s maximum (64-byte packets) For 100 Mpp/s: 148 810 pps maximum For 1000 Mb/s: 1 488 100 pps maximum Address database size: 16 000 entries at line rate (16 000 entries without flooding) Addressing: 48-bit MAC address Frame length: 64 to 1518 bytes (IEEE 802.1Q Untagged) 64 to 1 522 bytes (IEEE 802.1Q Tagged) Jumbo frame support: Up to 9 216 bytes Multilink trunks: Six trunks, four members per trunk VLANs: 256 port-based or protocol-based VLANs Tagging option Multiple Spanning Tree Groups: Up to eight STGs
Interface options	10 Base-T/100Base-TX/ RJ-45 (8-pin modular) connectors for Auto MDI/MDI-X interface 1000 Base -T with auto-polarity The 5510 Switches support the following SFP GBICs: • 1000 Base -SX Uses short wavelength 850 nm MTRJ or LC type fiber optic connectors to connect devices over multimode (275 m [902.3 ft], 62.5 um core or 550 m [1804.5 ft], 50.0 um core) fiber optic cable • 1000 Base-LX Uses long wavelength 1300nm duplex LC type fiber optic connector to connect devices over single mode (10 km [6.2 mi], 9 um core) fiber optic cable • 1000 Base -CWDM Uses long wavelength 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610 nm LC type fiber optic connector to connect devices over single mode (40 km [24.9 mi], 9 um core or 70 km [43.5 mi], 9 um core) fiber optic cable
Network Protocol and Standards compatibility	IEEE 802.3 10 Base-T (ISO/IEC 8802 3, Clause 14) IEEE 802.3u 100 Base-TX (ISO/IEC 8802-3, Clause 25) IEEE 802.3u Autonegotiation on Twisted Pair (ISO/IEC 8802-3, Clause 28) IEEE 802.3x (Flow Control on the Gigabit Uplink port) IEEE 802.3z 1000 Base-SX and 1000 Base-LX IEEE 802.1d MAC Bridges (ISO/IEC 10038) IEEE 802.1p (Prioritizing) IEEE 802.1Q (VLAN Tagging) IEEE 802.1D Spanning Tree Protocol IEEE 802.3ad (manual/static) IEEE 802.3ad (LACP) IEEE 802.1s IEEE 802.1w IETF DiffServ

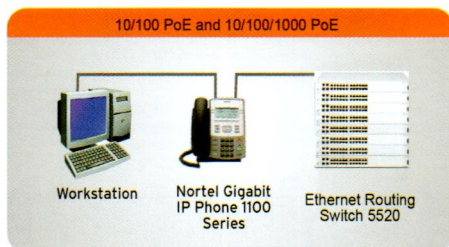
RFC support	RFC 1213 (MIB-II); RFC 1493 (Bridge MIB); RFC 1573 (IF-MIB); RFC 2863 (Interfaces Group MIB); RFC 2665 (Ethernet MIB); RFC 2737 (Entity MIBv2); RFC 2819 (RMON MIB); RFC 1757 (RMON); RFC 1271 (RMON); RFC 1157 (SNMP); RFC 2570 (SNMPv3); RFC 2571 (SNMP Frameworks); RFC 2573 (SNMPv3 Applications); RFC 2574 (SNMPv3 USM); RFC 2575 (SNMPv3 VACM); RFC 2576 (SNMPv3); RFC 2572 (SNMP Message Processing) RFC 791 (IP); RFC 792 (ICMP); RFC 793 (TCP); RFC 783 (TFTP); RFC 826 (ARP); RFC 768 (UDP); RFC 854 (TELNET); RFC951 (Bootp); RFC 2236 (IGMPv2); RFC 1112 (IGMPv1); RFC 1945 (HTTP v1.0); RFC 2138 (RADIUS); RFC 894 (IP over Ethernet); RFC 2674 (Q MIB); RFC 1058/RFC 1723 (RIPv1/v2); RFC 2030 (SNTP [Simple NTP])
Electrical specifications	Input voltage (ac version): 100-240 V ac (+/- 10%) at 47 to 63 Hz Input power consumption (ac version): 135 W max Input current (ac version): 1.3 A at 115 V ac, 0.65 A at 230 V ac Maximum thermal output: 460 BTU/hr
Environmental specifications	Operating temperature: 0° to 45°C (32° to 113°F) Storage temperature: -25° to 70°C (-13° to 158°F) Operating humidity: 85% maximum relative humidity, non-condensing Storage humidity: 95% maximum relative humidity, non-condensing Operating altitude: Up to 3024 m (10 000 ft) above sea level Storage altitude: Up to 3024 m (10 000 ft) above sea level
Safety Agency approvals	UL EN60950 (UL Listed or CSA 22.2 No. 60950 (CUL)) IEC 60950/EN 60950, CB report and certificate with all national deviations C22.2 No. 950 (CUL) with all national deviations UL-94-V1 flammability requirements for PC board NOM-019 (NOM)
Electromagnetic emissions summary	Meets the following standards: US: CFR47, Part 15, Subpart B, Class A Canada: ICES-003, Issue 3, Class A Australia/New Zealand: AS/NZS 3548:1995, A1:1997/A2:1997 Class A Japan: VCCI-V-3/02.04 Class A Taiwan: CNS 13438, Class A EN55022:1998/A1:2000 EN61000-3-2:2000 EN61000-3-3:1995/A1:2001
Electromagnetic immunity	The module meets the EN55024:1998/A1:2001 standard
Declaration of conformity	As stated in the Declaration of Conformity, the Ethernet Routing Switch 5510 Switch complies with the provisions of Council Directives 89/336/EEC and 73/23/EEC

Nortel Ethernet Routing Switch 5520 Series



Overview

The Nortel Ethernet Routing Switch (ERS) 5520 Power over Ethernet (PoE) switches are for medium to large enterprise customers who want to deploy Power over Ethernet in the wiring closet while maintaining connectivity to 10/100/1000 Mb/s Ethernet devices such as PCs. Built on the advanced features of the 5510 switches, the ERS 5520 PoE switches provide a stacking solution that offers greater performance, security, resiliency, and more IP services to the network edge. Any enterprise customer that plans to deploy applications such as IP telephony, WLAN, network cameras, and access control devices (for example, badge readers) can benefit from the convenience of having a single cable provide power and data traffic. With the 802.3af standard now ratified, an increasing number of devices will be powered in the next few years.



Ideal For

- enterprises that want an affordable long-term investment in the wiring closet
- enterprises that want to Power over Ethernet in the wiring closet now or in the future
- enterprises that work with large files and want fast file access
- medium to large single-site and multisite enterprises with demanding network needs including high bandwidth, high density and compact size
- enterprises that want QoS in the local area network
- enterprises that want to implement and support voice, video and data on the same network

Business Challenges

- Do you want to incorporate your LAN solution in the wiring closet to support your network for the next five years?
- Do you want an affordable enterprise-class Gigabit desktop connectivity?
- Do you have limited space available in your wiring closets?

- Do you work with large file sizes?
- Are you tired of long file transfer times?
- Do you plan to use collaborative applications in future?
- Do you want to minimize network down time?
- Do you require a high level of security at the edge of your network?
- Do you want to set levels of priority for key departments, users or applications?
- Are you considering implementing voice over IP (VoIP), video conferencing, online training, and video streaming on your network?

Typical Applications

- The Ethernet Routing Switch 5520 can provide power to devices such as Internet telephones, wireless LAN access points and network cameras. This switch can also provide connectivity to standard 10/100/1000 Mb/s Ethernet devices such as PCs and servers.
- The Ethernet Routing Switch 5520 addresses the needs for all vertical markets as they bring Gigabit connectivity and Power over Ethernet to the desktop. In particular,

- health care and medical for increased use of digitized scans (MRI or x-ray) that are typically very large
- Education, Universities, K-12
- digital media production (video editing,

[illegible]

- **High-density Gigabit desktop connectivity:** as many as eight switches can be stacked to achieve up to 384 10/100/1000 ports in a stack for pay as you grow capability while saving premium closet space.
- **Power over Ethernet support for current and future devices:** IP phones, wireless access points, network cameras, lighting, security and access control devices (for example, badge readers).
- **Innovative FAST stack design:** FAST stack design allows for simultaneous bidirectional traffic flow on each stacking port that results in up to 640 Gb/s stacking bandwidth for the stack, which is the highest stacking bandwidth in the industry today. Fast traffic flow across the stack for bandwidth-intensive applications.
- **High-performance switch fabric of 160 Gb/s:** wire-speed performance with no dropped packets.
- **Compact form factor** one-rack unit high design allows a stack to support up to 384 ports, saving premium space in the wiring closet.

- High-density Gigabit desktop connectivity

- desktop publishing
- corporate communications such as video-based training
- any industry that wants to deploy Power over Ethernet
- any industry that needs bulk data transfer

- **Power over Ethernet support** to IP phones, network cameras, wireless access points, security, lighting, and access control devices (for example, badge readers).
- **Innovative FAST stack design** FAST stack design for simultaneous bidirectional traffic flow on each stacking port that results in up to 640 Gb/s stacking bandwidth for the stack. The ERS 5520 delivers the highest stacking bandwidth in the industry today. The result is a faster traffic flow across the stack for bandwidth-intensive applications.
- **High-performance switch fabric of 160 Gb/s** wire-speed performance with no dropped packets
- **Compact form factor:** one rack-unit high design to support up to 384 10/100/1000 ports, which saves premium space in the wiring closet.
- **Layer 3 routing** supports dynamic routing features including RIPv1, RIPv2, OSPF, and ECMP, which improves the network performance as routing is achieved at the edge.
- **Resiliency** technologies such as SMLT.

Distributed MultiLink Trunking (DMLT), virtual router redundancy protocol (VRRP), IEEE 802.1s, 802.1w, and 802.1ad (static) help to ensure maximum availability of resources and the lowest downtime.

- **Convergence Enhancements** supports 802.1ab and Auto Detect/Auto Config (ADAC) for IP Telephony.
- **Plug-and-play settings** simplified Web-based configurations for data and power settings.
- **Auto Discovery feature** provides automatic recognition of a connection device with immediate power sent to it.
- **Single cable convenience** allows data and power transmitted over one cable without a power outlet.
- **Dynamic power management** for each port is configured to limit the power delivered to a device and is configured for power priority level: low, high, and critical.
- **Single software image** Ethernet Routing Switch 5520-48T-PWR, 5520-24T-PWR, 5510-48T, 5510-24T, and 5530-24TFD models to stack simplify software upgrades.
- **Automatic unit replacement feature**

retrieves the configuration for the failed switch from a server to the replacement switch to save time and ease configuration.

Market Information

The way in which businesses use LANs is changing and the performance requirement at the edge of the network is becoming increasingly demanding. IP Telephony and other collaborative applications drive more traffic to the edge of the network. As file sizes continue to grow, users need more bandwidth. With the convergence of voice, video, data, and storage, users can do more from their desktop.

Enterprises must address today's increased demands and still prepare for the unknown demands of tomorrow. By reassessing the use of the wiring closet, enterprises can achieve both goals and be assured that their investments are protected for a long time. According to the IDC Worldwide Power over Ethernet 2004-2008 Forecast and Analysis report, the Power over Ethernet market revenue is expected to grow at an 8.9 percent compound annual growth rate over the next five years.

Technical Specifications

Ethernet Routing Switch 5520 series

Physical specifications	Height: 4.45 cm (1.75 in.) Width: 43.82 cm (17.25 in.) Depth: 38.74 cm (15.25 in.) Weight: (—24-PWR): 8.4 kg (18.5 lb) (—48T-PWR): 8.8 kg (19.5 lb)
Performance specifications	Switch fabric bandwidth: 160 Gb/s for the switch; Up to 1280 Gb/s for the full stack Stacking bandwidth: 80 Gb/s for the switch; Up to 640 Gb/s for the full stack Maximum data throughput: 768 Gb/s for a full stack of 5520-48T-PWR Frame forwarding rate: 71.4 Mpp/s for the 5520-48T-PWR and 35.7 Mpp/s for the 5520-24T-PWR; 571.4 Mpp/s for a full stack of 8 5520-48T-PWR units
Port forwarding and filtering performance	For 10 Mb/s: 14 880 p/s maximum (64-byte packets) For 100 Mb/s: 148 810 p/s maximum For 1000 Mb/s: 1 488 100 p/s maximum Address database size: 16 000 entries at line rate (16 000 entries without flooding) Addressing: 48-bit MAC address Frame length: 64 to 1518 bytes (IEEE 802.1Q Untagged) 64 to 1522 bytes (IEEE 802.1Q Tagged) Jumbo frame support: Up to 9216 bytes Multi-Link Trunks: Up to six trunks, four members per trunk VLANs: Up to 256 port- or protocol-based per VLAN tagging option Multiple Spanning Tree Groups: Up to eight STGs

Interface options	10 Base-T and 100 Base-TX/ RJ-45 (8-pin modular) connectors for Auto MDI/MDI-X interface 1000 Base-T with autopolarity
SFP GBIC support	1000 Base-SX: Uses short wavelength 850 nm MTRJ or LC type fiber optic connectors to connect devices over multimode (275 m or [902 ft], 62.5 um core or 350 m or [1148 ft], 50.0 um core) fiber optic cable 1000 Base-LX: Uses long wavelength 1300 nm duplex LC type fiber optic connector to connect devices over single mode (10 km or [6.2 mi], 9 um core) fiber optic cable 1000 Base-CWDM: Uses long wavelength 1470, 1490, 1510, 1530, 1350, 1570, 1590, 1610 nm LC type fiber optic connector to connect devices over single mode (40 km or [24.9 mi], 9um core or 70 km or [43.5 mi], 9um core) fiber optic cable
Network protocol and Standards compatibility	IEEE 802.3 10 Base-T (ISO/IEC 8802 3, Clause 14) IEEE 802.3u 100 Base-TX (ISO/IEC 8802-3, Clause 25) IEEE 802.3u Autonegotiation on Twisted Pair (ISO/IEC 8802-3, Clause 28) IEEE 802.3x (Flow Control on the Gigabit Uplink port) IEEE 802.3z 1000Base-SX and 1000Base-LX IEEE 802.1d MAC Bridges (ISO/IEC 10038) IEEE 802.1p (Prioritizing) IEEE 802.1Q (VLAN tagging) IEEE 802.1D Spanning Tree Protocol IEEE 802.3ad (manual/static) IEEE 802.3ad (LACP)† IEEE 802.1s IEEE 802.1w IETF DiffServ † Future software release
RFC support	RFC 1213 (MIB-II) RFC 1493 (Bridge MIB) RFC 1573 (IF-MIB) RFC 2863 (Interfaces Group MIB) RFC 2665 (Ethernet MIB) RFC 2737 (Entity MIBv2) RFC 2819 (RMON MIB) RFC 1757 (RMON) RFC 1271 (RMON) RFC 1157 (SNMP) RFC 2570 (SNMPv3) RFC 2571 (SNMP Frameworks) RFC 2573 (SNMPv3 Applications) RFC 2574 (SNMPv3 USM) RFC 2575 (SNMPv3 VACM) RFC 2576 (SNMPv3) RFC 2572 (SNMP Message Processing) RFC 791 (IP) RFC 792 (ICMP) RFC 793 (TCP) RFC 783 (TFTP) RFC 826 (ARP) RFC 768 (UDP) RFC 854 (TELNET) RFC951 (BootP) RFC 2236 (IGMPv2) RFC 1112 (IGMPv1) RFC 1945 (HTTP v1.0) RFC 2138 (RADIUS) RFC 894 (IP over Ethernet) RFC2674 (Q MIB) RFC 1058/RFC 1723 (RIPv1/v2) RFC 2030 (SNTP [Simple NTP]) † Future software release

Electrical specifications	Input voltage (ac version): 100-240 V ac (+/- 10%) at 47 to 63 Hz Input power consumption (ac version): 90 W max Input current (ac version): 0.8 A maximum Input voltage (rms): 100 to 240 V ac at 50 to 60 Hz Maximum thermal output: 310 BTU/hr
Environmental specifications	Operating temperature: 0° to 45°C (32° to 113°F) Storage temperature: -25° to 70°C (-13° to 158°F) Operating humidity: 85% maximum relative humidity, non-condensing Storage humidity: 95% maximum relative humidity, non-condensing Operating altitude: Up to 3024 m (10 000 ft) above sea level Storage altitude: Up to 3024 m (10 000 ft) above sea level
Mean Time Between Failures	335 000 hours
Safety Agency approvals	UL60950 CSA 22.2 No. 60950 (CUL) IEC 60950/EN 60950, CB report and certificate with all national deviations UL-94-V1 flammability requirements for PC board NOM-019 (NOM)
Electromagnetic emissions summary	Meets the following standards: US: CFR47, Part 15, Subpart B, Class A Canada: ICES-003, Issue 3, Class A Australia/New Zealand: AS/NZS 3548:1995, A1:1997/A2:1997 class A Japan: VCCI-V-3/02.04 class A Taiwan: CNS 13438, Class A EN55022:1998/A1:2000 EN61000-3-2:2000 EN61000-3-3:1995/A1:2001
Electromagnetic immunity	The module meets the EN55024:1998/A1:2000 standard
Declaration of conformity	As stated in the Declaration of Conformity, the Ethernet Routing Switch 3510 complies with the provisions of Council Directives 89/336/EEC and 73/23/EEC

Nortel Ethernet Routing Switch 5530-24TFD



Overview

A new addition to the Nortel Ethernet Routing Switch 5000 Series, the Nortel Ethernet Routing Switch 5530-24TFD, is a next-generation stackable 10/100/1000 Mb/s Ethernet Layer 3 routing switch that provides high-density Gigabit desktop connectivity, Gigabit fiber connectivity, and dual 10 Gigabit Ethernet uplink connections for medium and large enterprise customers wiring closets. The 5530 Switch combines high flexibility of deployment using Gigabit copper or fiber connections with exceptional performance using dual 10 Gigabit uplinks. The 5530 Switch is a scalable and resilient solution that provides exceptional security features and support for enhanced convergence while minimizing capital and operational expenses.

The Ethernet Routing Switch 5530-24TFD provides with 24 10/100/1000 Base-T RJ-45 ports, 12 shared Small Form Factor Pluggable (SFP) slots, and 2 slots for 10 Gigabit Ethernet Small Form Factor Pluggable (XFP) modules. The switch includes two built-in stacking ports in a compact one rack-unit high design. The Ethernet Routing Switch 5530-24TFD can be used in stand-alone mode, or stacked in a mixed stack of eight units with existing Ethernet Routing Switch 5510-24T/48T or 5520-24T/48T-PWR devices.

Ideal For

- enterprises that want an affordable long-term investment in the wiring closet
- enterprises that work with large files and want fast file access
- medium to large single-site and multisite enterprises with demanding network needs including high bandwidth, high density, and small size
- enterprises that require quality of service (QoS) in the local area network
- enterprises that want to implement and support voice, video and data on the same network

Business Challenges

- Do you want to incorporate your current LAN solution in the wiring closet to support your network for the next five years?
- Do you want an affordable enterprise-class Gigabit desktop connectivity?
- Are you tired of long file transfer times?
- Do you work with large file sizes?
- Do you have limited space available in your wiring closets?
- Do you plan to use collaborative applications in future?
- Do you want to minimize network down time?
- Do you require a high level of security at the edge of your network?
- Do you want to set priority levels for key

departments, users, or applications?

- Do you plan to implement Voice over IP (VoIP), video conferencing, on-line training, or video streaming on your network?

Typical Applications

- Gigabit desktop connectivity
- aggregating Gigabit traffic from wiring closet switches
- high-speed uplinks to the core
- Gigabit server aggregation

Key Points

- high flexibility of deployment using high-density Gigabit copper or fiber connection—up to 192 10/100/1000 ports or 96 SFP ports in a stack
- exceptional uplink performance using dual 10 Gigabit ports with up to sixteen 10G ports in a stack
- flexible stacking across 5510, 5520, and 5530 switches
- innovative FAST stack design for faster traffic flow across the stack for bandwidth-intensive applications
- wire-speed operation with no packet loss with 160 Gb/s switch fabric
- minimal network down time using resilient connectivity, fail-safe stacking, and power redundancy
- secure access and data traffic protection

Features and Benefits

- **high flexibility of deployment using high-density Gigabit copper or fiber connection:** up to 192 10/100/1000 ports or 96 SFP ports. Pay as you grow while saving premium closet space
- **exceptional uplink performance using dual 10 Gigabit ports:** up to sixteen 10 Gt ports in a stack for fast network performance
- **flexible stacking:** across 5510, 5520 and 5530 switches to simplify software upgrades and network operations
- **innovative FAST stack design:** for faster traffic flow across the stack for bandwidth-intensive applications
- **High-performance switch fabric:** of 160 Gb/s using wire-speed performance with no dropped packets
- **Layer 3 routing:** supports dynamic routing features including RIPv1, RIPv2, OSPF and ECMP that improve the network performance as routing is achieved at the edge
- **Resiliency:** technologies such as Split Multilink trunking (SMLT), Distributed MultiLink trunking (DMLT), virtual router redundancy protocol (VRRP), IEEE 802.1s, 802.1w and 802.1ad (static) ensure maximum availability of resources and the lowest downtime

Market Information

Performance requirements at the edge of the network become increasingly demanding. IP Telephony and other collaborative applications drive more traffic to the edge of the network. As file sizes continue to grow, users need more bandwidth. The convergence of voice, video, data and storage enables users to do more from the desktop. Enterprises must address today's increased demands and still prepare for the unknown demands of tomorrow. By re-assessing how to use the wiring closet, enterprises can achieve both goals and be assured that their investment are protected over time. Ethernet Routing Switch 5530 provides high-density Gigabit desktop connectivity for medium and large enterprise customers wiring closets. It offers a scalable and resilient solution that provides exceptional security features and support for enhanced convergence while minimizing capital and operational expenses.

Technical Specifications

Ethernet Routing Switch 5530 series

Physical specifications	Height: 4.45 cm (1.75 in.) Width: 43.82 cm (17.25 in.) Depth: 38.74 cm (15.25 in.) Weight: 6.5 kg (14.5 lb)
Performance specifications	Maximum Switch fabric bandwidth: 192 Gb/s for the switch; up to 1563 Gb/s for the full stack Typical Switch fabric bandwidth: 168 Gb/s for the switch; up to 1344 Gb/s for the full stack Maximum Stacking bandwidth: 96 Gb/s for the switch; up to 768 Gb/s for the full stack Typical Stacking bandwidth: 80 Gb/s for the switch; up to 640 Gb/s for the full stack Maximum data throughput: 704 Gb/s for a full stack of 5530s Frame forwarding rate: 65.5 Mpp/s; 523.8 Mpp/s for a full stack of eight 5530s

Port forwarding and filtering performance	For 10 Mb/s: 14 880 p/s maximum (64-byte packets) For 100 Mb/s: 148 810 p/s maximum For 1000 Mb/s: 1 488 100 p/s maximum For 10000 Mb/s: 14 881 000 p/s maximum Address database size: 16 000 entries at line rate (16 000 entries without flooding) Addressing: 48-bit MAC address Frame length: 64 to 1518 bytes (IEEE 802.1Q Untagged) 64 to 1522 bytes (IEEE 802.1Q Tagged) Jumbo frame support: Up to 9216 bytes Multilink trunks: Six trunks, four members per trunk VLANs: 256 port-based or protocol-based VLANs Tagging option Multiple Spanning Tree Groups: Up to eight STGs
Interface options	10 Base-T/100Base-TX/ RJ-45 (8-pin modular) connectors for Auto MDI/MDI-X interface 1000 Base-T with auto-polarity The 5530 Switch supports the following SFP GBICs: 1000 Base-SX Uses short wavelength 850 nm MTRJ or LC type fiber optic connectors to connect devices over multimode (275 m [902 ft], 62.5 μm core or 550 m [1804 ft], 50.0 μm core) fiber optic cable 1000 Base-LX Uses long wavelength 1300 nm duplex LC type fiber optic connector to connect devices over single mode (10 km [6.2 mi], 9 μm core) fiber optic cable 1000 Base-CWDM Uses long wavelength 1470, 1490, 1510, 1530, 1550, 1570, 1590, 1610 nm LC type fiber optic connector to connect devices over single mode (40 km [24.9 mi], 9 μm core or 70 km [43.5 mi], 9 μm core) fiber optic cable The 5530 Switch supports the following 10 Gigabit XFPs: 10 GBase-LR Uses wavelength 1310nm, Single mode fiber, up to 10 km, LC connector 10 GBase-ER Uses wavelength 1550 nm, Single mode fiber, up to 40 km, LC connector 10 GBase-SR Uses wavelength 850nm, Multi mode fiber (22 m [72.2 ft] at 62.5 μm/160 MHz/km MMF, or 33 m [108.3 ft] at 62.5 μm/200 MHz/km MMF, or 66 m [216.5 ft] at 62.5 μm/500 MHz/km MMF, or 82 m [269 ft] at 50 μm/500 MHz/km MMF, or 300 m [984.3 ft] at 50 μm/2000MHz/km MMF), LC connector
Network protocol and Standards compatibility	IEEE 802.3 10 Base-T (ISO/IEC 8802-3, Clause 14) IEEE 802.3u 100 Base-TX (ISO/IEC 8802-3, Clause 25) IEEE 802.3u Autonegotiation on Twisted Pair (ISO/IEC 8802-3, Clause 28) IEEE 802.3x (10/100 Flow Control) IEEE 802.3z 1000 Base-SX and 1000 Base-LX IEEE 802.3ae 10 Gigabit XFP IEEE 802.1d MAC Bridges (ISO/IEC 10038) IEEE 802.1p (Prioritizing) IEEE 802.1Q (VLAN Tagging) IEEE 802.1D Spanning Tree Protocol IEEE 802.3ad (manual/static) IEEE 802.3ad (LACP) IEEE 802.1s IEEE 802.1w IETF DiffServ

RFC Support	RFC 1213 (MIB-II); RFC 1493 (Bridge MIB); RFC 1573 (IF-MIB); RFC 2863 (Interfaces Group MIB); RFC 2665 (Ethernet MIB); RFC 2737 (Entity MIBv2); RFC 2819 (RMON MIB); RFC 1757 (RMON); RFC 1271 (RMON); RFC 1157 (SNMP); RFC 2570 (SNMPv3); RFC 2571 (SNMP Frameworks); RFC 2573 (SNMPv3 Applications); RFC 2574 (SNMPv3 USM); RFC 2575 (SNMPv3 VACM); RFC 2576 (SNMPv3); RFC 2572 (SNMP Message Processing) RFC 791 (IP); RFC 792 (ICMP); RFC 793 (TCP); RFC 783 (TFTP); RFC 826 (ARP); RFC 768 (UDP); RFC 854 (TELNET); RFC951 (Bootp); RFC 2236 (IGMPv2); RFC 1112 (IGMPv1); RFC 1945 (HTTP v1.0); RFC 2138 (RADIUS); RFC 894 (IP over Ethernet); RFC 2674 (Q MIB); RFC 1058/RFC 1723 (RIPv1/v2); RFC 2030 (SNTP [Simple NTP])
Electrical specifications	Input voltage (ac version): 100-240 V ac (+/- 10%) at 47 to 63 Hz Input power consumption (ac version): 135 W max Input current (ac version): 1.3 A at 115 V ac, 0.65 A at 230V ac Maximum thermal output: 512 BTU/hr
Environmental specifications	Operating temperature: 0° to 50°C (32° to 122°F) Storage temperature: -40° to +85°C (-40° to 185°F) Operating humidity: From 10% to 85% maximum relative humidity, non-condensing Storage humidity: From 10% to 95% maximum relative humidity, non-condensing Operating altitude: Up to 4572 m (15 000 ft) maximum above sea level Storage altitude: Between -340.8 m (-1000 ft) and 12 192m (40 000 ft) above sea level
Safety Agency Approvals	IEC 60950/EN 60950, CB report and certificate with all national deviations EN60950 GS Licensed UL EN60950 NRTL Licensed C22.2 No. 60950 SCC Licensed (can be combined with UL 60950 NRTL License) UL-94-V1 flammability requirements or better for PC board and all plastics NOM-019 (NOM) Additional country licensing as required (currently some products for Argentina, Brazil, Chili, Peru and Venezuela).
Electromagnetic Emissions Summary	Meets the following standards: CISPR22 International Emissions Specification, Class A minimum with 6dB margin US: CFR47, FCC Part 15, Subpart B, Class A Canada: ICES-003, Issue 3, Class A Australia/New Zealand: AS/NZS 3548 Class A Japan: VCCI-V-3/02.04 class A Taiwan: CNS 13438, Class A Korea: MIC Licensed Europe: EN55022:1998/A1:2000 EN61000-3-2:2000 EN61000-3-3:1995/A1:2001
Electromagnetic Immunity	CISPR24 International EMC Immunity EN55024:1998/A1:2001 standard including EN61000-4-2, -4-3, -4-4, -4-5, -4-6, -4-8 as applicable
Declaration of Conformity	As stated in the Declaration of Conformity, the Ethernet Routing Switch 5530-24TFD complies with the provisions of Council Directives 89/336/EEC and 73/23/EEC.

Ordering Information

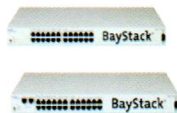
For further information, contact your local Nortel representative.

Nortel Ethernet Switch Portfolio

The Nortel Ethernet Switching portfolio includes a wide range of products that securely deliver Layer 2 desktop connectivity and Layer 3 through 4 aware quality of service (QoS). Each product delivers the speed, performance, and flexibility that today's enterprise networks require. The portfolio also offers a simplified architecture that can accommodate exponential bandwidth growth, a true competitive advantage for businesses of various sizes. Nortel Ethernet Switch 325 and 425 models are cost-effective offerings ideal for small and medium enterprises and branch office applications. Nortel Ethernet Switch 460, 470, and 470-PWR stackable solutions include scalability, resiliency, security, and convergence-readiness required by today's application- and competition-driven enterprise networks.

- Nortel Ethernet Switch 325
- Nortel Ethernet Switch 425
- Nortel Ethernet Switch 460-24T-PWR
- Nortel Ethernet Switch 470
- Nortel Ethernet Switch 470-PWR
- Nortel Ethernet Switch Power Supply Unit 10

Nortel Ethernet Switch 325



Overview

Nortel Ethernet Switch 325 is a stand-alone 10/100 Mb/s Layer 2 Ethernet switch that features easy configuration, high-speed uplinks, and Web-based management from a Web browser. Nortel Ethernet Switch 325 is available in two stand-alone, compact one rack-unit (1RU) size models: the Nortel Ethernet Switch 325-24T and the Nortel Ethernet Switch 325-24G. The Nortel Ethernet Switch 325-24T has 24 10Base-T/100BaseE-TX autosensing ports. The Nortel Ethernet Switch 325-24G has 24 10Base-T/100Base-TX autosensing ports plus two 10/100/1000Base-T ports for uplink connectivity to servers or backbone switches. The Nortel Ethernet Switch 325 is Layer 3- and DiffServ-capable using a software upgrade.

Ideal For

Small to medium businesses and branch offices that need a desktop switching solution.

Business Challenges

- Are you concerned about cost when considering switching purchases?
- Do you want a switch that is easy to install and configure?
- Do you want easy Web-based network management?

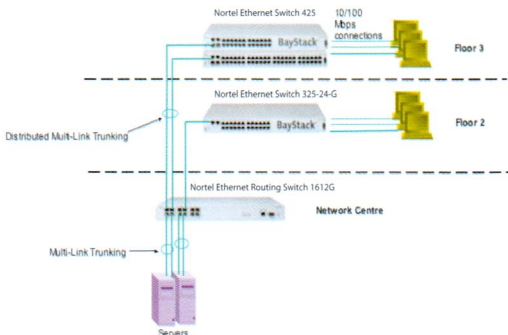
- Do you want to connect devices at 10 Mb/s and 100 Mb/s without purchasing new equipment?
- Do you currently use Nortel Ethernet Switches or other competitor's hubs?

Typical Applications

Typical applications include:

- business applications such as e-mail, Internet traffic, and file transfers
- gigabit uplinks to connect servers or backbone switches

Network Diagram



Key Points

- cost-effective desktop switching for small and medium enterprises and branch offices
- easy to use
- uplink connectivity for server or backbone connections
- easy Web-based management
- one rack-unit high compact design with low power consumption
- lifetime warranty

Features and Benefits

- **Full autosensing on every port:** each switch has auto-sensing ports to accommodate 10 Mb/s or 100 Mb/s devices.
- **Ethernet switch software:** allows Nortel Ethernet Switch 325 models to use a single software image that provides new features.
- **Robust feature set:** provides enterprise class quality features such as 802.1x, SSHv2, multilink trunking and 802.1Q/p at a cost-effective price.
- **Wire-speed throughput:** the 16 gigabit per second (Gb/s) switch fabric for each switch supports full frame forwarding and filtering across all ports at wire-speed performance.
- **High-speed uplink ports:** the Nortel Ethernet Switch 325-24G Switch provides two 10/100/1000Base-T ports in the front of the unit that provide high-speed connections to backbone switches or servers.
- **MultiLink Trunking (MLT):** enables link grouping between a Nortel Ethernet Switch 325 and another switch or a server to provide high bandwidth with active redundant links. The Nortel Ethernet Switch 325 supports as many as six MLTs for each switch with as many as four ports for each MLT.
- **32 port-based VLANs:** can be established for each switch to extend the broadcast domain and segment network traffic for high network efficiency.

- **Support for 8000 MAC addresses:** provides scalability for growing networks with many attached devices and workgroups connected to each switch.
- **IEEE 802.1p priority queuing:** is standards based and enables priority to the order in which the switch forwards packets on a per-port basis. Up to four queues can be set on a Nortel Ethernet Switch 325 with IEEE 802.1p compliance.
- **DSCP recognition and prioritization:** prioritize traffic based on not only 802.1p compliance, but on Diffserv Code Point (DSCP) marking through the switch.
- **Web-based management:** provide summary, configuration, fault, statistics, application, administration, and support pages can be provided using a Web browser. Real-time sampling provides up-to-date LED statistical information. The Web interface allows static configuration for numerous parameters of the device.

Market Information

Nortel Ethernet Switch 325 addresses the needs of small and medium organizations. The switch helps save money by connecting devices at either 10 Mb/s or 100 Mb/s without new switches to accommodate different speeds. Easy Web-based management features will save organizations significant time in setting up the switches. Also, the ease-of-use features require minimal technical expertise to configure it.

Technical Specifications

Performance	• Switch fabric bandwidth: 16 Gb/s • Frame forwarding rate • Ethernet Switch 325-24T: 3.6 million packets per second (Mpps) • Ethernet Switch 325-24G: 6.6 million Mpps • Switched 10 Mb/s forwarding rate: 14 880 pps maximum • Switched 100 Mb/s forwarding rate: 148 810 pps maximum • Switched 1000 Mb/s forwarding rate: 1 488 810 pps maximum • Memory: 16 MB memory architecture shared by all ports 4 MB Flash Memory 16 MB SDRAM • Address database size: 8000 entries at line rate • Addressing: 48-bit MAC address • Frame Length: 64 – 1518 bytes (IEEE 802.1Q Untagged) • 68 to 1522 bytes (IEEE 802.1Q Tagged)
Interface Options	• 10BASE-T/100BASE-TX: RJ-45 (8-pin modular) connectors for Auto MDI/MDI-X interface with auto-polarity • 10BASE-T/100BASE-TX/1000BASE-T: RJ-45 (8-pin modular) connectors for MDI-X

RFC Support	• RFC 1213 (MIB-II); RFC 1493 (Bridge MIB); RFC 2863 (Interfaces Group MIB); • RFC 2665 (Ethernet MIB); RFC 2737 (Entity MIBv2); RFC 2819 (RMON MIB); • RFC 1757 (RMON); RFC 1271 (RMON); RFC 1157 (SNMP); RFC 2570 (SNMPv3); • RFC 2571 (SNMP Frameworks); RFC 2573 (SNMPv3 Applications); • RFC 2574 (SNMPv3 USM); RFC 2575 (SNMPv3 VACM); RFC 2576 (SNMPv3); • RFC 2572 (SNMP Message Processing); RFC 791 (IP); RFC 792 (ICMP); RFC 793 (TCP); RFC 783 (TFTP); RFC 826 (ARP); RFC 768 (UDP); RFC 854 (TELNET); • RFC951 (Bootp); RFC 2236 (IGMPv2); RFC 1112 (IGMPv1); RFC 1945 (HTTP v1.0); • RFC 2138 (RADIUS); RFC 894 (IP over Ethernet); RFC 2674 (Q MIB)
Electromagnetic Emissions	Meets the following standards: • US: CFR47, Part 15, Subpart B, Class A • Canada: ICES-003, Issue 3, Class A • Australia/New Zealand: AS/NZS 3548:1995, Class A, A1:1997/A2:1997 Class A • Japan: VCCI-V-3/02.04 class A • Taiwan: CNS 13438, Class A • Europe: - EN55022:1998/A1:2000 - EN61000-3-2:2000 - EN61000-3-3:1995/A1:2001 - CISPR 22-1997/A1:2000 Class A
Electromagnet Immunity	Ethernet Switch 325 meets the EN55024:1998/A1:2001 standard
Physical Dimensions	Height: 4.37 cm (1.72 in.) Width: 43.82 cm (17.25 in.) Depth: 22.91 cm (9.02 in.) Weight: 3 kg (6.61 lb)
Power Requirements	Input voltage (ac version): 100 to 240 V ac at 47 to 63 Hz Input power consumption (ac version): 46 W maximum Input current (ac version): 2 A at 120 V ac, 1 A at 240 V ac Maximum thermal output: 75 BTU per hour
Environmental	Operating temperature: 0° to 40°C (32° to 104°F) Storage temperature: -25° to 70°C (-13° to 158°F) Operating humidity: 10 to 85% maximum relative humidity, non-condensing Storage humidity: 10 to 95% maximum relative humidity, non-condensing Operating altitude: Up to 3024 m (10 000 ft) above sea level Storage altitude: Up to 3024 m (10 000 ft) above sea level
Standards and Certifications	IEEE 802.3 10BASE-T (ISO/IEC 8802-3, Clause 14) IEEE 802.3u 100BASE-TX (ISO/IEC 8802-3, Clause 25) IEEE 802.3u Autonegotiation on Twisted Pair (ISO/IEC 8802-3, Clause 28) IEEE 802.3x (Flow Control on the Gigabit Uplink ports) IEEE 802.3z (Gigabit) IEEE 802.1d MAC Bridges (ISO/IEC 10038) IEEE 802.1p (Prioritizing) IEEE 802.1Q (VLAN Tagging) IEEE 802.1D (Spanning Tree Protocol) IEEE 802.3ad (manual/static) IEEE 802.3ad (LACP) IEEE 802.1s IEEE 802.1w UL EN60950 (UL 1950 and CSA 22.2 No. 60950) IEC 60950/EN60950, CB report and certificate with all national deviations C22.2 No. 950 (CUL) with all national deviations UL-94-V1 flammability requirements for PC board NOM-019

Ordering Information

For further information, contact your local Nortel representative.

Nortel Ethernet Switch 425

Overview

Nortel Ethernet Switch 425 is a stackable 10/100 Mb/s Layer 2 Ethernet switch that features easy configuration, flexible choices for high-speed uplinks, and Web-based management from your Web browser. Nortel Ethernet Switch 425 is available in two models: the Nortel Ethernet Switch 425-24T Switch and the Nortel Ethernet Switch 425-48T Switch.

The Nortel Ethernet Switch 425-24T has 24 10Base-T/100Base-TX autosensing ports, two flexible combination uplink ports and built-in stacking ports. The ERS 425-24T can be used stand-alone or in a stack of up to eight switches for up to 192 10/100 Mb/s ports that can be managed easily as a single unit. The Nortel Ethernet Switch 425-48T can also be used stand-alone or in a stack of up to eight switches for up to 384 10/100 Mb/s ports. The Nortel Ethernet Switch is to be Layer 3- and DiffServ-capable through a software upgrade.

Ideal For

The Nortel Ethernet Switch 425 is ideal stackable switching solution for small to medium businesses.

Business Challenges

- Are you concerned about cost when considering switching purchases?
- Do you want a switch that is easy to install and configure?
- Do you want easy Web-based network management?
- Do you want to connect devices at 10 Mb/s and

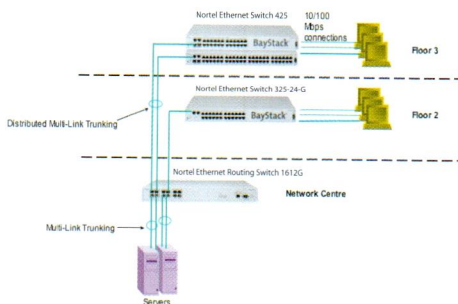
100 Mb/s without purchasing new equipment?

- Do you currently use Nortel or another competitor hub?
- Do you expect your business to grow within the next 6 to 18 months?

Typical Applications

- High-density desktop switching and network segmentation.
- High-speed LAN connectivity and data access.
- Flexible uplink options to connect to servers or backbone switches.

Network Diagram



Key Points

- cost-effective stackable switching for small and medium enterprises
- up to 384 10/100 Mb/s ports for desktop switching in an eight-rack unit high design
- Plug-and-Play stacking with built-in stacking ports
- easy to use
- flexible combination uplink ports for wiring closet or backbone connections
- resilient uplink connectivity for minimal network downtime
- easy Web-based management
- one rack-unit high compact design with low power consumption
- flexible stacking of Nortel Ethernet Switches 425-24T and 425-48T; a stack is a single entity with a single IP address
- lifetime warranty

Features and Benefits

- A scalable, stackable architecture enables up to eight switches to be connected to support up to 384 ports.
- Two flexible combination uplink ports provide high-speed connectivity to wiring closet or backbone devices.
- Wire-speed performance is delivered by a 16 Gb/s switch fabric that supports full-frame forwarding and filtering across all ports at wire-speed performance.
- Ethernet Switch Software is a single software image that is used for Nortel Ethernet Switch 425-24T, Nortel Ethernet Switch 420-24T and Nortel Ethernet Switch 425-48T.
- Cost-effective 10/100 Layer 2 Ethernet switch provides 24 or 48 10Base-T/100Base-TX autosensing ports, two flexible combination uplink ports, and built-in stacking ports that reduce cost by eliminating the need to purchase cascade modules.

- Distributed multi-link trunking (DMLT) allows trunked ports to span multiple units of the stack for redundant connectivity to mission-critical servers and the network center.
- Up to 255 port-based VLANs for each switch to extend the broadcast domain and segment network traffic for high network efficiency. The switch can support up to 256 VLANs in the future.
- Support for 8000 MAC addresses provides scalability for growing networks with many attached devices and workgroups connected to each switch.
- User interface button on the front panel to select the base unit and to reset the unit or the stack.
- Auto MDI/MDI-X feature on each port allows the use of either a crossover or straight-through cable to connect to a hub or switch.
- IEEE 802.1p queuing prioritizes the order in which the switch forwards packets. The switch supports up to four queues.

Market Information

Nortel Ethernet Switch 425 addresses the needs of small and medium organizations. The switches help save money by allowing connecting devices at either 10 Mb/s or 100 Mb/s without new switches to accommodate different speeds. In addition, the switches are scalable and small and medium businesses (SMBs) know that their investments are protected as their businesses grow. Easy Web-based management features and Plug-and-Play stacking ports will save organizations significant time in setting up the switches. Also, the ease-of-use features require minimal technical expertise for configuration.

Technical Specifications

Performance specifications (64-byte packets)	- Switch fabric bandwidth: 16 Gb/s - Frame forwarding rate: 6.6 Mpps (Ethernet Switch 425-24T) - Frame forwarding rate: 10.1 Mpps (Ethernet Switch 425-48T) - Switched 10 Mb/s forwarding rate: 14 880 pps - Switched 100 Mb/s forwarding rate: 148 810 pps - Switched 1000 Mb/s forwarding rate: 1 488 100 pps - Memory: 32 MB memory architecture shared by all ports, 4 MB Flash Memory, 16 MB SDRAM - Address database size: 8000 entries at line rate - Addressing: 48-bit MAC address - Frame length: 64 to 1518 bytes (IEEE 802.1Q Untagged) 68 to 1522 bytes (IEEE 802.1Q Tagged)
Data rate and encoding	10 Mb/s: Manchester encoding 100 Mb/s: 4B/5B encoding 1000 Mb/s: 8B/10B
Electromagnetic emissions (US)	Meets the following standards: - US: CFR47, Part 15, Subpart B, Class A - Canada: ICES-003, Issue 3, Class A - Australia/New Zealand: AS/NZS 3548:1995, Class A, A1:1997/A2:1997 Class A - Japan: VCCI-V-3/02.04 Class A - Taiwan: CNS 13438, Class A - Europe: EN55022:1998/A1:2000 - EN61000-3-2:2000 - EN61000-3-3:1995/A1:2001 - CISPR 22-1997/A1:2000 Class A
Electromagnetic Immunity	The Ethernet Switch 425-24T and Ethernet Switch 425-48T Switches meet the EN55024:1998/A1:2001 standard.
Interface Options	10Base-T/100Base-TX: - RJ-45 (8-pin modular) connectors for Auto MDI/MDI-X interface with autopolarity The Ethernet Switch 425 Switches support the following SFP GBICs: 1000BASE-SX: Uses short wavelength 850 nm MTRJ or LC type fiber optic connectors to connect devices over multimode (275 m, 62.5 um core or 550 m, 50, um core) fiber optic cable. 1000BASE-LX: Uses long wavelength 1300nm duplex LC type fiber optic connector to connect devices over single mode (10 km, 9um core) fiber optic cable.
Physical Dimensions	Ethernet Switch 425-24T: Height: 4.37 cm (1.72 in.) Width: 43.82 cm (17.25 in.) Depth: 22.91 cm (9.02 in.) Weight: 3 kg (6.61 lb) Ethernet Switch 425-48T Height: 4.37 cm (1.72 in.) Width: 43.82 cm (17.25 in.) Depth: 22.91 cm (9.02 in.) Weight: 3.1 kg (6.83 lb)
Power requirements	Input voltage (ac version): 100 to 240 V ac at 47 to 63 Hz Input power consumption (ac version): 46 W maximum Input current (ac version): 2 A at 120 V ac, 1 A at 240 V ac Maximum thermal output: 75 BTU/hour

Environmental	Operating temperature: 0° to 40°C (32° to 104°F) Storage temperature: -25° to 70°C (-13° to 158°F) Operating humidity: 10 to 85% maximum relative humidity, noncondensing Storage humidity: 10 to 95% maximum relative humidity, non-condensing Operating altitude: Up to 3024 m (10 000 ft) above sea level Storage altitude: Up to 3024 m (10 000 ft) above sea level
Standards and certifications	IEEE 802.3 10BASE-T (ISO/IEC 8802-3, Clause 14) IEEE 802.3u 100BASE-TX (ISO/IEC 8802-3, Clause 25) IEEE 802.3u Autonegotiation on Twisted Pair (ISO/IEC 8802-3, Clause 28) IEEE 802.3x (Flow Control on the Gigabit Uplink ports) IEEE 802.3z Gigabit IEEE 802.1d MAC Bridges (ISO/IEC 10038) IEEE 802.1p (Prioritizing) IEEE 802.1Q (VLAN Tagging) IEEE 802.1D (Spanning Tree Protocol) IEEE 802.3ad (manual/static) IEEE 802.3ad (LACP) IEEE 802.1s IEEE 802.1w UL EN60950 (UL 1950 and CSA 22.2 No. 60950) IEC 60950/EN60950, CB report and certificate with all national deviations C22.2 No. 950 (CUL) with all national deviations UL-94-V1 flammability requirements for PC board NOM-019

Ordering Information

For further information, contact your local Nortel representative.

Nortel Ethernet Switch 460-24T-PWR



Overview

The Nortel Ethernet Switch 460-24T-PWR Power over Ethernet is a resilient, secure, stackable switch with IEEE 802.3af Power over Ethernet (PoE) capabilities to power devices such as IP phones, wireless access points, network cameras, security and lighting devices, and access control devices (badge readers). The switch has 24 10/100 Mb/s ports, 1 media-dependent adapter (MDA) slot for uplink connectivity and 1 cascade module slot for stacking. The switch has advanced features such as advanced quality of service (QoS) and high resiliency with the addition of Power over Ethernet capability. The switch enables enterprise customers to power devices while maintaining connectivity to standard 10/100 Mb/s Ethernet devices such as PCs and servers. All 24 ports of the Nortel Ethernet Switch 460 can be powered. The Ethernet Switch Software allows the Nortel Ethernet Switch 460 to stack with other Nortel Ethernet Switches and protects your existing investment in Nortel Ethernet Switch 450, 470 and Nortel Business Policy Switches.

Ideal For

- Medium to large enterprises that need to provide power to a wide range of devices and to deliver QoS for mission-critical devices, applications, groups, and users.
- Enterprise businesses that want to deploy IP phones, wireless LAN access points, network cameras and other products that can take advantage of Power over Ethernet.

Business Challenges

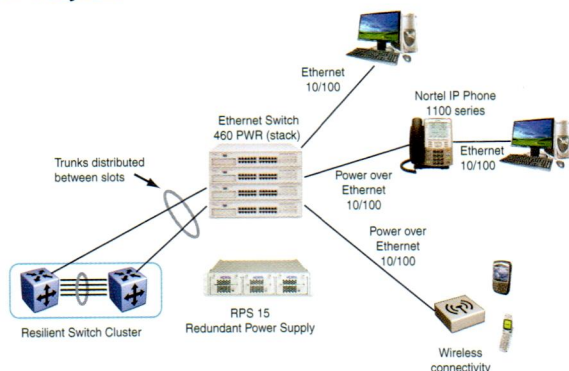
- Do your users experience slow application and response time?
- Are you looking for a reliable infrastructure to deploy IP telephony to minimize downtime?
- Do you want industry-standard solutions that are based on industry standards to ensure vendor interoperability?
- Do you want to expand your current network in the future to support multimedia applications such as IP telephony?

- Do you want to deploy PoE enabled WLAN APs in your network?
- Do you want to deploy network cameras for security surveillance over your data network infrastructure?
- Do you have multiple, distant offices (up to 70 km) that need to share resources?
- Are you concerned about cost when considering a switching purchase?
- Do you expect your business and the associated traffic in your network to grow within the next 6 to 18 months?

Typical Applications

- Multisite campus environments that require high bandwidth and secure connections to each desktop.
- Power IP phones over Ethernet link.
- Power wireless access points for increased mobility.
- Power surveillance cameras and card readers to provide high security.

Network Diagram



Key Points

- Power to IP phones, wireless LAN access points, network cameras, security and lighting devices, and access control devices.
- Provides power to all 24 ports.
- Common software (Ethernet Switch Software) across all Nortel platforms for low training and installation costs.
- IEEE 802.3af compliant to power multiple vendors' equipment - does not tie enterprises to any one vendor.
- Automatically provides power to a detected device.
- Network availability with QoS features.
- Fail-safe stacking design assures continuous uptime.
- Resilient connectivity for minimal network downtime.
- Secure access and data traffic protection.
- Simplifies the process of making additions, moves, and changes (MAC).
- Dual functionality supports both Power over Ethernet (PoE) devices and standard LAN devices.
- Significant cost and space savings by integrating standard LAN switch functionality with power over unshielded twisted pair (UTP) cable of a mid-span patch panel into one unit.
- Convenient use of a single cable to transmit data and power over one cable without using

a power outlet.

- Plug-and-Play IP telephony switching provides simplified Web-based configurations on data and power properties.
- Seamless user migration and stackable with Nortel Ethernet Switch 450, Nortel Ethernet Switch 470, and 470-PWR models.
- Lifetime-Warranty.

Features and Benefits

The Nortel Ethernet Switch 460-24T-PWR Power over Ethernet (PoE) provides a resilient, secure, stackable wiring closet switch with PoE capabilities to support IEEE 802.3af-compliant devices such as IP phones, wireless LAN access points and network cameras. The switch delivers advanced quality of service (QoS) capabilities to enable connectivity and network availability to mission-critical users and for delay-intolerant applications such as IP telephony. The Nortel Ethernet Switch 460-24T-PWR Power over Ethernet (PoE) eliminates the need to plug devices into separate power outlets, making additions, moves and changes easy. The Nortel Ethernet Switch 460-24T-PWR can directly power the Nortel IP Telephony Clients including the Nortel IP Phones 2002, 2004, and 2007.

- **IEEE 802.3af compliant:** Nortel Ethernet Switch 460-24T-PWR is IEEE 802.3af compliant. It can provide Power over Ethernet to any IEEE 802.3af-compliant devices such

as IP phones, wireless access points, network cameras, security and lighting devices, and access control devices. Interoperable with standards-based equipment means that organizations are not tied to any one vendor as the switch has the flexibility to power multiple vendors devices. The 460 can supply power up to 15.4 Watts per port, which meets the IEEE 802.3af standard and is more than sufficient to power most devices.

- **Convenience of a single cable:** with the Nortel Ethernet Switch 460, data and power transmit over one cable without using a power outlet. A separate cable is unnecessary to connect the device to a power outlet.
- **High availability with QoS features:** network availability for mission critical applications, devices and users enables LAN traffic to be classified, prioritized, and marked.
- **Automatic discovery feature:** Nortel Ethernet Switch 460-24T-PWR automatically recognizes a connected device and immediately sends power to it. This automatic capability ensures fast connectivity without manual intervention.
- **Plug-and-Play IP telephony switching:** Nortel Ethernet Switch 460 provides simplified Web-based configurations on data and power properties. The graphical user interfaces make it simple to set up data and power configurations.
- **Fail-safe stacking and resiliency:** a key difference for the Nortel Ethernet Switch 460 is its resilient stacking feature. The Nortel Ethernet Switch 460 can stack up to eight units with a cascade stacking design, to help ensure continuous uptime even if a switch in the stack fails. A loop-back, or redundant cascade cable, seamlessly connects the entire stack to eliminate any single point of failure.
- **MultiLink Trunking (MLT):** the group of links between the Nortel Ethernet Switch 460 and another switch or a server provides high bandwidth with active redundant links. With the Nortel unique Distributed MultiLink Trunking (DMLT) feature, trunked ports can span multiple units of the stack for fail-safe connectivity to mission-critical servers and the network center. DMLT provides bandwidth of up to 800 Mb/s (when used with 10/100 ports) or up to 8 Gb/s

(when used with Gigabit uplink ports) with active redundant links in one trunk with support for up to six trunks for each switch or stack. The Split Multi-Link Trunking (SMLT) feature of the Nortel Ethernet Routing Switch 8000 eliminates single points of failure and allows wiring closet switches, such as the Nortel Ethernet Switch 460, to have multiple active connections to the network core. The Nortel Ethernet Switch 460ability can have multiple connections to a Nortel Ethernet Routing Switch 8600 network core to allow enterprises to double network bandwidth with no extra investment. The Nortel Ethernet Routing Switch 8600 provides a self-healing network that delivers the reliability and availability required by today's mission-critical applications.

- **Common software lowers training and installation costs:** Nortel Ethernet switches, including the Nortel Ethernet Switch 460, have a common "look and feel," which reduces training costs. Tools include the Web, command line interface (CLI), menus, Nortel Enterprise Network Management System (NMS), Nortel Ethernet Switching Element Manager, and Nortel Enterprise Policy Manager.
- **Significant space and cost savings:** traditionally, a mid-span patch panel device connects using a UTP CAT5 cable to a standard Ethernet switch and then the mid-span device sends power over another standard UTP CAT 5 cable to the device (such as an IP phone). In essence, two units are needed for power over Ethernet capability. In contrast, the Nortel Ethernet Switch 460 integrates standard LAN switch functionality with the power over UTP cable capability of a mid-span patch panel into one unit. This results in significant cost and space savings.
- **Dynamic power management:** each port is configurable to limit the power delivered to a device. Each port is configurable for power priority level: low, high, and critical. On the switch, total available power is monitored. In the case where all available power is fully used, the switch may turn off lower priority ports and turn on higher priority ports.
- **Active circuit protection:** the Nortel Ethernet

Switch 460 can automatically disable a port if there is a short occurs. All the other ports on the switch remain active and are not affected by the disabled port.

- **Extensive security features:** the Nortel Ethernet Switch 460 delivers a number of security features including EAP over LAN (IEEE 802.1x), SNMPv3, SSH (secure shell) version 2, BaySecure. MAC-address-based security, and RADIUS authentication. A user-based policy feature enables network services such as QoS to follow the user regardless of which port is accessed.
- **Custom autonegotiation advertisements (CANAs):** the network manager can tune the capabilities that a particular Ethernet port can advertise using autonegotiation.
- **Unit replacement feature:** a failed switch configuration from a server to the replacement switch can be retrieved. This feature that simplifies adding and deleting a switch on the stack without service interruption. It also reduces switch downtime and improves productivity.

Market Information

The Nortel Ethernet Switch 460-24T-PWR Power over Ethernet is one of the first IEEE 802.3af-compliant switches on the market. Power any standards-compliant device with the Nortel Ethernet Switch 460-24T-PWR.

The switch also provides investment protection by being backwards compatible with Nortel Ethernet Switch 450s, the Nortel Ethernet Switch 470-24T, and the Nortel Ethernet Switch 470-48T.

Technical Specifications

Performance specifications	• Frame Forward Rate (64-byte packets): Up to 3.2 million packets per second (pps) maximum, learned unicast traffic • Port Forwarding/Filtering Performance - For 10 Mb/s: 14 880 pps (64-byte packets) maximum - For 100 Mb/s: 148 810 pps maximum • Address Database Size: 16 000 entries at line rate (32 000 entries without flooding) • Addressing: 48-bit MAC address • Frame Length: 64 to 1518 bytes (IEEE 802.1Q Untagged), 64 to 1522 bytes (IEEE 802.1Q Tagged) • Data Rate: 10 Mb/s Manchester encoded or 100 Mb/s 4B/5B encoded
GBICs supported	• 1000Base-SX: Uses shortwave 850 nm fiber optic connectors to connect devices over multimode (550 m or 1805 ft) fiber optic cable. • 1000Base-LX: Uses longwave 1300 nm fiber optic connectors to connect devices over single mode (5 km or 3.1 mi) or multimode (550 m or 1805 ft) fiber optic cable. • 1000BaseE-XD: Uses single mode fiber to connect devices over distances up to 40 km (31 mi), depending on the quality of the cable. • 1000Base-ZX: Uses single mode fiber to connect devices over distances up to 70 km (43 mi), depending on the quality of the cable. The ports on this GBIC operate only in full-duplex mode.

RFC supported	RFC 1213 (MIB-II); RFC 1493 (Bridge MIB); RFC 2863 (Interfaces Group MIB); RFC 2665 (Ethernet MIB); RFC 2737 (Entity MIBv2); RFC 2819 (RMON MIB); RFC 1757 (RMON); RFC 1271 (RMON); RFC 1157 (SNMP); RFC 2748 (COPS); RFC 2940 (COPS Clients); RFC 3084 (COPS Provisioning); RFC 2570 (SNMPv3); RFC 2571 (SNMP Frameworks); RFC 2572 (SNMP Message Processing); RFC 2573 (SNMPv3 Applications); RFC 2574 (SNMPv3 USM); RFC 2575 (SNMPv3 VACM); RFC 2576 (SNMPv3); RFC 791 (IP); RFC 792 (ICMP); RFC 793 (TCP); RFC 783 (TFTP); RFC 826 (ARP); RFC 768 (UDP); RFC 854 (TELNET); RFC951 (Bootp); RFC 2236 (IGMPv2); RFC 1112 (IGMPv1); RFC 1945 (HTTP v1.0); RFC 2138 (RADIUS)
Electromagnetic immunity	Global: CISPR 24:1997/A1:2001 Europe: EN55024:1998/A1:2001
Physical dimensions	Height: 7.04 cm (2.77 in.) Width: 43.82 cm (17.25 in.) Depth: 38.35 cm (15.1 in.) Weight: 5.8 kg (12.76 lb)
Power requirements	Input voltage: 100-240 V ac at 47 to 63 Hz Input Power Consumption: 400 W maximum Input Volt Amperes Rating : 440 VA maximum Input Current: 4.5 A at 100 V ac, 2.25 A at 240 V ac Maximum Thermal Rating: 575 BTU/hr
Environmental	Operating temperature: 0° to 40°C (32° to 104°F) Storage temperature: -25° to 70°C (-13° to 158°F) Operating humidity: 85% maximum relative humidity, noncondensing Storage humidity: 95% maximum relative humidity, noncondensing Operating altitude: Up to 3048 m (10 000 ft) Storage altitude: Up to 3048 m (10 000 ft)
Standards and Certifications	IEEE 802.3af compliant IEEE 802.3 10BASE-T (ISO/IEC 8802 3, Clause 14) IEEE 802.3u 100BASE-TX (ISO/IEC 8802-3, Clause 25) IEEE 802.3u 100BASE-FX (ISO/IEC 8802-3, Clause 26) IEEE 802.1p (Prioritizing) IEEE 802.1Q (VLAN Tagging) IEEE 802.1z (Gigabit) IEEE 802.1x IEEE 802.3x IEEE 802.3ad (manual/static) IEEE 802.3ad (LACP)* IEEE 802.1s IEEE 802.1w IETF DiffServ UL Listed (UL60950) CUL (CAN/CSA-22.2 No. 60950) CB certificate and report with all national deviations (IEC 60950/EN60950) US: CFR47, Part 15, Subpart B, Class A Canada: ICES-003, Issue 3, Class A Australia/New Zealand: AS/NZ 3548: 1995/A1:1997/A2; 1997, Class A Japan: VCCI-V-3/02.04/ Class A Taiwan: CNS 13438, Class A Europe: EN 55022-1998/A1:2000 Class A EMC Directive: 89/336/EEC: Directly published in the EMC Directive of 89/ 336/EEC with Modification 92/31/EEC, 93/13/, EC, EN 61000-3-2: 2000, EN 61000-3-3: 1995/A1:2001 Global: CISPR 22-1997/A1:2000, Class A

Ordering Information

For further information, contact your local Nortel representative.

Nortel Ethernet Switch 470



Overview

Nortel Ethernet Switch 470 models are stackable 10/100 Mb/s Ethernet Layer 2 switches. The Nortel Ethernet Switch 470 is available in two models: the Nortel Ethernet Switch 470-48T and the Nortel Ethernet Switch 470-24T.

The Ethernet Switch 470 models comprehensive quality of service (QoS) features ensure connectivity and network availability by managing and prioritizing data traffic and users for maximum performance. Nortel Ethernet Switch 470 offers a scalable, resilient solution that minimizes capital and operational expenses. The robust security features offer protection against unauthorized access to data traffic. The Ethernet Switch Software allows the Nortel Ethernet Switch 470 modules to stack with other Nortel Ethernet Switches and protects existing investments in the Nortel Ethernet Switch 450.

The Ethernet Switch 470-48T supports flexible configuration: Ports 47 and 48 are configurable as 10/100base-TX or make use of the built-in GBIC. Stack as many as eight Ethernet Switch 470-48T models to achieve up to 384 10/100 ports for high-density desktop switching. The Ethernet Switch 470-24T allows simultaneous use of all 26 ports.

Ethernet Switching software allows the Ethernet Switch 460-24T-PWR, 470, and 470-PWR models to stack together and be managed as a single entity for maximum flexibility. Up to eight switches can be combined in a stack using a single image that simplifies software upgrades.

Ideal For

- Medium to large single-site and multi-site enterprises with demanding network needs including high bandwidth, high density, and reduced size.
- Enterprises that require QoS guarantees in their local area network and need resilient fail-safe stackability.
- Enterprises that want to implement and support voice and video on the same network.
- Organizations concerned with performance, business value and price effectiveness.

Business Challenges

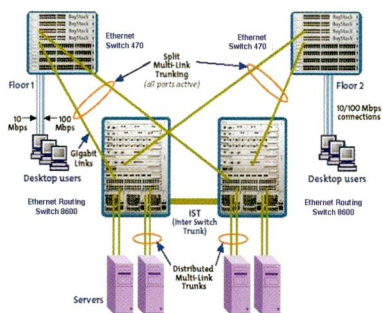
- Are you looking for a reliable solution that will support your business needs now, as well as your future requirements?
- Would you like to set levels of priority for key departments, users or applications?
- Are you considering implementing voice over IP (VoIP), video conferencing, online training and/or video streaming on your network?

- Do you have limited space available in your wiring closets?
- Do most of your wiring closet switches have gigabit uplinks?
- Is high port count in a compact space at an attractive price important to you?
- Do you want to minimize the network down time?
- Do you currently have Nortel Ethernet Switch 450 and Nortel Business Policy Switches installed in your network?

Typical Applications

- Key department or personnel prioritization requirements such as help desk, service teams or key management.
- High bandwidth requirements such as multimedia (video and application streaming), e-commerce, and Web applications.
- Delay-intolerant applications such as IP telephony.

Network Diagram



Split Multi-link Trunking (SMLT)

Key Points

- Industry-leading QoS capabilities and features
- Web-based management.
- Only one rack-unit high.
- Innovative built-in stacking ports
- Two built-in GBIC ports for highest uplink capacity per switch in stack.
- Fail-safe stacking and resiliency.
- Authenticated switch port access and authenticated and encrypted management.
- Built-in stacking ports mean no cascade modules to order.
- Stack with Ethernet Switch 450, 460, 470, and 470-PWR models.
- Ethernet Switch software lowers training and installation costs.
- Lifetime warranty.

Features and Benefits

- **High-density desktop connectivity:** stack up to eight switches to achieve up to 384 10/100 ports for high-density desktop switching.
- **Cost-effective, simple stacking:** two built-in stacking ports provide simple, quick and cost-effective stacking because expensive stacking modules are not required.
- **Higher uplink capacity:** two built-in GBIC ports provide dedicated uplink connectivity to network core switches such as the Ethernet Routing Switch 8600. This doubles the uplink bandwidth as GBIC ports are not required for stacking. Up to 16 GBIC ports are available for pure uplink connectivity in a full stack.

- **Fail-safe stacking:** continuous uptime is assured even if a switch fails and a single point of failure is eliminated.
- **Resilient connectivity for minimal network downtime:** with Nortel Distributed Multi Link Trunking (DMLT) feature, trunked ports can span multiple units of the stack for fail-safe connectivity to mission-critical servers and the network core. Nortel Ethernet Routing Switch 8600 Split Multi Link Trunking (SMLT) eliminates single points of failure in the network and allows Nortel Ethernet Switch 470s to have multiple active connections to the network core.
- **Secure access and data traffic protection:** features include Secure Shell (SSH), BaySecure, RADIUS, IP manager list, access list, SNMP v3, password protection, and extensible authentication protocol (EAP) over LAN. The user-based policy feature enables network services, such as QoS, to follow the user regardless of the user's port connection.
- **High availability with QoS features:** mission-critical applications, devices, and users are available by classifying, prioritizing, and marking LAN traffic.
- **Custom auto negotiation advertisements (CANAs):** autonegotiation enables the network manager to tune the capabilities of a particular Ethernet port.
- **Common software lowers training and installation costs:** Nortel Ethernet Switches have a common "look and feel," which reduces

training costs. These tools include the Web, command line interface (CLI), menus, Nortel Enterprise Network Management System (NMS), the Nortel Ethernet Switching Element Manager, and Nortel Enterprise Policy Manager.

- **Unit replacement feature:** a failed switch's configuration can be retrieved from a server on to the replacement switch, a feature that simplifies the addition and deletion of a switch to the stack without service interruption. Switch downtime is reduced while productivity is improved.
- **Save money and time with auto MDI/MDI-X feature:** auto MDI/MDI-X eliminates the need for expensive cross-over cables while connecting to a hub or switch. The switch port can automatically detect the signal on the cable and configure itself appropriately.

Market Information

Ethernet Switch 470 models are stackable 10/100 Mb/s Ethernet Layer 2 switches. Ethernet Switch 470 includes two built-in GBIC (Gigabit Interface Converter) uplink ports and built-in stacking ports in a compact, one rack-unit high design. They are designed to provide high-density desktop connectivity for mid-size and large enterprise customers' wiring closets. The comprehensive Quality of Service (QoS) features are designed to ensure connectivity and network availability by managing and prioritizing data traffic for maximum performance. These switches offer a scalable, resilient solution that minimizes capital and operational expenses.

Technical Specifications

Save money and time with auto MDI/MDI-X feature — Auto MDI/MDIX eliminates the need for expensive cross-over cables while connecting to a hub or switch. The switch port can detect the signal on the cable and configure itself appropriately.

Performance specifications	Port Forwarding/Filtering Performance: For 10 Mb/s: 14 880 pps maximum (64-byte packets) For 100 Mb/s: 148 810 pps maximum For 1000 Mb/s: 1 488 100 pps maximum • Address Database Size 16 000 entries at line rate (32 000 entries without flooding) • Addressing 48-bit MAC address • Frame Length: 64 to 1518 bytes (IEEE 802.1Q Untagged) 64 to 1552 bytes (IEEE 802.1Q Tagged)
Data rate	10 Mb/s Manchester encoded or 100 Mb/s 4MB - 5MB encoded
Interface options	10BASE-T/100BASE-TX RJ-45 (8-pin modular) with Auto MDI/MDIX The Ethernet Switch 470 supports the following GBICs: • 1000BASE-SX uses short wavelength 850 nm fiber optic connectors to connect devices over multimode (550 m or 1805 ft) fiber optic cable. • 1000BASE-LX uses long wavelength 1300 nm fiber optic connectors to connect devices over single mode (5 km or 3.1 mi) or multimode (550 m or 1805 ft) fiber optic cable. • 1000BASE-XD uses single mode fiber to connect devices over distances up to 40 km (31 mi), depending on the quality of the cable. • 1000BASE-ZX uses single mode fiber to connect devices over distances up to 70 km (43 mi), depending on the quality of the cable. The ports on this GBIC operate only in full-duplex mode. • 1000Base-T uses 8-pin modular RJ-45 connector to connect devices up to 100 m over Category 5 cable • 1000Base-CWDM Eight GBIC types with 1470-1610nm (in 20nm intervals) with LC connector to connect devices over distances up to 70 km (43 mi)

RFC support	RFC 791 (IP); RFC 792 (ICMP); RFC 793 (TCP); RFC 783 (TFTP); RFC 826 (ARP); RFC 768 (UDP); RFC 854 (TELNET); RFC 951 (Bootp); RFC 2236 (IGMPv2); RFC 1112 (IGMPv1); RFC 1945 (HTTP v1.0); RFC 2138 (RADIUS); RFC 1573 (IF-MIB); RFC 894 (IP over Ethernet); RFC 2674 (Q MIB); RFC 2030 (Simple NTP); RFC 1213 (MIB-II); RFC 1493 (Bridge MIB); RFC 2863 (Interfaces Group MIB); RFC 2665 (Ethernet MIB); RFC 2737 (Entity MIBv2); RFC 2819 (RMON MIB); RFC 1757 (RMON); RFC 1271 (RMON); RFC 1157 (SNMP); RFC 2748 (COPS); RFC 2940 (COPS Clients); RFC 3084 (COPS Provisioning); RFC 2570 (SNMPv3); RFC 2571 (SNMP Frameworks); RFC 2572 (SNMP Message Processing); RFC 2573 (SNMPv3 Applications); RFC 2574 (SNMPv3 USM); RFC 2575 (SNMPv3 VACM); RFC 2576 (SNMPv3)
Safety Agency approvals	• USA: UL60950 • Canada: CAN/CSA-22.2 No.60950 • Europe: EN60950 / IEC 60950, CB report with all national deviation • Australia/New Zealand: AS/NZS 60950 • Mexico: NOM-019
Electromagnetic immunity	Europe, EN55024, CISPR 24
Physical dimensions	Height: 4.37 cm (1.72 in.) Width: 43.82 cm (17.25 in.) Depth: 35.29 cm (13.89 in.) Weight: 4.8 kg (10.56 lb) for —24T; 5.0 kg (11.0 lb) for —48T
Power requirements	Input voltage (ac version) 100-240 V ac @ 47 to 63 Hz Input Power consumption (ac version) 90 W max Input current (AC Version) 1.0 A @ 100 V ac, 0.5 A @ 240V ac
Environmental	Operating temperature 0° to 40°C (32° to 104°F) Storage temperature -25° to 70°C (-13° to 158°F) Operating humidity 85% maximum relative humidity, non-condensing Storage humidity 95% maximum relative humidity, non-condensing Operating altitude up to 3024 m (10 000 ft) above sea level Storage altitude up to 12 192 m (40 000 ft) above sea level
Standards and Certifications:	IEEE 802.3 10BASE-T (ISO/IEC 8802 3, Clause 14) IEEE 802.3u 100BASE-TX (ISO/IEC 8802-3, Clause 25) IEEE 802.3u Autonegotiation on Twisted Pair (ISO/IEC 8802-3, Clause 28) IEEE 802.3x (Flow Control on the Gigabit Uplink port) IEEE 802.3z 1000BASE-SX and 1000BASE-LX IEEE 802.1d MAC Bridges (ISO/IEC 10038) IEEE 802.1p (Prioritizing) IEEE 802.1Q (VLAN Tagging) IEEE 802.3ad (Static/dynamic- LACP) IEEE 802.1s IEEE 802.1w IETF DiffServ USA: FCC CFR47 Part 15, subpart B, Class A Canada: ICES-003, Class A Europe: EN55022, CISPR 22, Class A Australia/New Zealand: AS/NZS 3548, Class A Japan: VCCI-V-3/02.04, Class A Taiwan: CNS 13438, Class A CE

Ordering Information

For further information, contact your local Nortel representative.

Nortel Ethernet Switch 470-PWR



Overview

The Nortel Ethernet Switch 470-PWR, a new addition to the Ethernet Switch 470 product family, is a stackable solution that provides resiliency, security, and convergence readiness required by today's application- and competition-driven enterprise networks. The Ethernet Switch 470-PWR delivers Layer 2 switching with Power over Ethernet models for simplified network deployments, driving lower Total Cost of Ownership and is ideal for medium and large enterprises as well as for branch office use.

The Ethernet Switch 470-PWR is available in two models: the Ethernet Switch 470-24T-PWR with 24 10/100 ports supporting PoE plus 2 GBICs; the Ethernet Switch 470-48T-PWR with 48 10/100 ports supporting PoE and 2 GBICs. Both models include built-in stacking ports, redundant power support, and are available in compact one rack-unit high design.

Ideal For

- Medium to large enterprises with an identified need to provide power to a wide range of devices and to deliver QoS for mission-critical devices, applications, groups, and users.
- Enterprise businesses that want to deploy IP phones, wireless LAN access points, network cameras, and other products that can take advantage of PoE.

Business Challenges

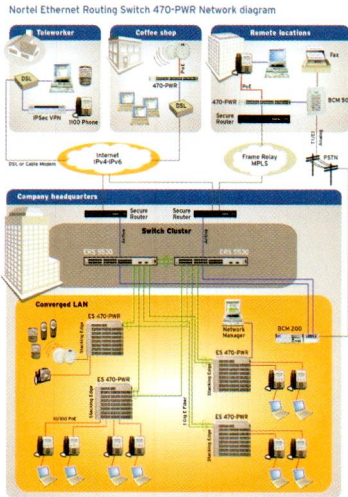
- Do your users experience slow application and response time?
- Do you want a reliable infrastructure to deploy IP telephony to minimize downtime?
- Do you want solutions that are based on industry standards to ensure vendor interoperability?
- Do you want to future proof your network to support multimedia applications like IP telephony?
- Do you want to deploy PoE enabled WLAN APs in your network?

- Do you want to deploy network cameras for security surveillance over your data network infrastructure?
- Do you have multiple, distant offices (up to 70 km) that need to share resources?
- Are you concerned about cost when considering a switching purchase?
- Do you expect your business and the associated traffic in your network to grow within the next 6 to 18 months?

Typical Applications

- Multisite campus environments that require high bandwidth and secure connections to each desktop.
- Provide power to IP phones over Ethernet link.
- Provide power to wireless access points for increased mobility.
- Provide power to surveillance cameras and card readers to provide high security.

Network Diagram



Key Points

- Power to IP phones, wireless LAN access points, network cameras, security and lighting devices, and access control devices.
- Provides power to all 24 ports.
- Common software (Ethernet Switch Software) across all Nortel platforms for low training and installation costs.
- Automatically provides power to a detected device.
- Network availability with QoS features.
- Fail-safe stacking design assures continuous uptime.
- Resilient connectivity for minimal network downtime.
- Secure access and data traffic protection.
- Simplifies the process of making moves, adds, and changes (MAC).
- Dual functionality supports both PoE devices and standard LAN devices.
- Significant cost and space savings by integrating standard LAN switch functionality with power over unshielded twisted pair (UTP) cable of a mid-span patch panel into one unit.

- Convenient use of single cable to transmit data and power over one cable without using a power outlet.
- Plug-and-Play IP telephony switching provides simplified Web-based configurations on data and power properties.
- Seamless user migration, stackable with Nortel Ethernet Switch 460-24T-PWR, 470-24T, 470-48T and 470-48T-PWR.
- Lifetime warranty.

Features and Benefits

- **High-density PoE switch:** stack up to eight switches to achieve up to 384 10/100 ports and to manage the switches as a single entity. Ideal for mid-to-large enterprises that need an advanced stackable switch with PoE capabilities.
- **IEEE 802.3af compliant:** provides PoE to any IEEE 802.3af-compliant devices such as IP phones, wireless access points, network cameras, lighting devices and security control devices.
- **Policy-enabled networking:** enables advanced Quality of Service for mission-critical

applications such as Voice over IP and enables security filters to be deployed at the edge to safeguard the network.

- **Convenience of a single cable:** transmit data and power over one cable without using a power outlet.
- **Plug-and-Play IP Telephony:** the graphical user interfaces make it easy to set up data and power configurations. Automatic discovery and configuration capability (ADAC) enables the switch to detect Nortel IP phones and automatically configure the port and QoS parameters.
- **Power Redundancy using RPS 15:** continues to provide power to IP phones in case of power failure. Helps provide up to 15.4 watts on all ports for the 48 port model.
- **Resilient connectivity for minimal network downtime:** using the Distributed Multi Link Trunking (DMLT) feature, trunked ports can span across the stack for fail-safe connectivity to mission-critical servers and the network center. Split Multi Link Trunking

(SMLT) in the network core allows 470-PWR switches to have multiple active fault-tolerant connections.

- **Fail-safe stacking:** assures continued stack operation.
- **Compact one rack-unit (1RU) size:** saves installation space.
- **Ease of Use features:** easy installation with auto MDI/MDX, 10/100 autosensing and Customizable Autonegotiation Advertisement (CANA).
- **Ethernet Switching Software:** allows Ethernet Switch 460-24T-PWR and 470 Switches to stack together with a single image to simplify software upgrades.

Market Information

The Nortel Ethernet Switch 470-PWR Power over Ethernet is IEEE 802.3af. Power any standards-compliant device with the Nortel Ethernet Switch 470-PWR. The Nortel Ethernet Switch 470-PWR also provides investment protection by being backwards compatible with Nortel Ethernet Switch 460 and 470 models.

Technical Specifications

Connectivity	Number of ports 10/100 ports — 24 or 48 per switch Gigabit — 2 full sized GBICs per switch Stacking — 2 Built-in stacking port per switch Stacking Support: Maximum of 8 units per stack
DTE power	ac only 370 Watts maximum RPSU 740 Watts maximum Signal pair power delivery Power classification support
Performance specifications	Port Forwarding/Filtering Performance: For 10 Mb/s: 14 880 pps maximum (64-byte packets) For 100 Mb/s: 148 810 pps maximum For 1000 Mb/s: 1 488 100 pps maximum Address Database Size 16 000 entries at line rate (32 000 entries without flooding) • Addressing 48-bit MAC address • Frame Length: 64 — 1518 bytes (IEEE 802.1Q Untagged) 64 — 1552 bytes (IEEE 802.1Q Tagged)
Data rate	10 Mb/s Manchester encoded or 100 Mb/s 4MB — 5MB encoded

Interface options	10BASE-T/100BASE-TX RJ-45 (8-pin modular) with Auto MDI/MDIX The Ethernet Switch 470 supports the following GBICs: • 1000BASE-SX uses short wavelength 850 nm fiber optic connectors to connect devices over multimode (550 m or 1805 ft) fiber optic cable. • 1000BASE-LX uses long wavelength 1300 nm fiber optic connectors to connect devices over single mode (5 km or 3.1 mi) or multimode (550 m or 1805 ft) fiber optic cable. • 1000BASE-XD uses single mode fiber to connect devices over distances up to 40 km (31 mi), depending on the quality of the cable. • 1000BASE-ZX uses single mode fiber to connect devices over distances up to 70 km (43 mi), depending on the quality of the cable. The ports on this GBIC operate only in full-duplex mode. • 1000Base-T uses 8-pin modular RJ-45 connector to connect devices up to 100 m over Category 5 cable • 1000Base-CWDM Eight GBIC types with 1470-1610nm (in 20nm intervals) with LC connector to connect devices over distances up to 70 km
RFC support	RFC 791 (IP); RFC 792 (ICMP); RFC 793 (TCP); RFC 783 (TFTP); RFC 826 (ARP); RFC 768 (UDP); RFC 854 (TELNET); RFC 951 (Bootp); RFC 2236 (IGMPv2); RFC 1112 (IGMPv1); RFC 1945 (HTTP v1.0); RFC 2138 (RADIUS); RFC 1573 (IF-MIB); RFC 894 (IP over Ethernet); RFC 2674 (Q MIB); RFC 2030 (Simple NTP); RFC 1213 (MIB-II); RFC 1493 (Bridge MIB); RFC 2863 (Interfaces Group MIB); RFC 2665 (Ethernet MIB); RFC 2737 (Entity MIBv2); RFC 2819 (RMON MIB); RFC 1757 (RMON); RFC 1271 (RMON); RFC 1157 (SNMP); RFC 2748 (COPS); RFC 2940 (COPS Clients); RFC 3084 (COPS Provisioning); RFC 2570 (SNMPv3); RFC 2571 (SNMP Frameworks); RFC 2572 (SNMP Message Processing); RFC 2573 (SNMPv3 Applications); RFC 2574 (SNMPv3 USM); RFC 2575 (SNMPv3 VACM); RFC 2576 (SNMPv3)
Safety Agency approvals	Safety Agency Approvals IEC 60950 International CB Certification EN 60950 European Certification UL60950 US certification CSA22.2, #60950 Canadian Certification NOM Mexican Certification
Electromagnetic immunity	Europe, EN55024, CISPR 24
Physical dimensions	Width: 44.1 cm (17.3 in.) Height: 1RU 4.4 cm (1.73 in.) Depth: 38.2 cm (15.04 in.)
Weight	470-24T-PWR: 7.14 kg (15.7 lb) 470-48T-PWR: 7.32 kg (16.1 lb)
Power requirements	IAC: Power supply ac 100–240 V, 50–60Hz, 1.5A max, 1+1 Redundant
Environmental	Operating temperature 0° to 40°C (32° to 104°F) Storage Temperature: –25° to 55°C (–13° to 131°F) Humidity: 10% to 90% noncondensing Storage humidity 95% maximum relative humidity, noncondensing Operating altitude up to 3024 m (10 000 ft) above sea level Storage altitude up to 12 192 m (40 000 ft) above sea level

Standards	IEEE 802.3 10BASE-T (ISO/IEC 8802-3, Clause 14) IEEE 802.3u 100BASE-TX (ISO/IEC 8802-3, Clause 25) IEEE 802.3u Autonegotiation on Twisted Pair (ISO/IEC 8802-3, Clause 28) IEEE 802.3x (Flow Control on the Gigabit Uplink port) IEEE 802.3z 1000BASE-SX and 1000BASE-LX IEEE 802.1d MAC Bridges (ISO/IEC 10038) IEEE 802.1D Spanning Tree IEEE 802.1P Priority Queues IEEE 802.1Q (VLAN Tagging) IEEE 802.3ad (Static/dynamic- LACP) IEEE 802.1s IEEE 802.1w Rapid Spanning Tree DiffServ
Standards Compliance	RFC 768 Unreliable Datagram Protocol (UDP) RFC 783 Trivial File Transfer Protocol (TFTP) RFC 791/950 Internet Protocol (IP) RFC 792 Internet Control Message Protocol (ICMP) RFC 826 Address Resolution Protocol (ARP) RFC 854 Telnet Telnet client and Server SNTP RFC 1542 BOOTP RFC 2236 Internet Group Management Protocol (IGMP) v2 802.1X Ethernet Authentication Protocol IEEE 802.1s Multiple Spanning Tree Groups IEEE 803.3ad Link Aggregation
Certifications	USA: FCC CFR47 Part 15, subpart B, Class A Canada: ICES-003, Class A Europe: EN55022, CISPR 22, Class A Australia/New Zealand: AS/NZS 3548, Class A Japan: VCCI-V-3/02.04, Class A Taiwan: CNS 13438, Class A CE
Electromagnetic immunity	EN55024:1998 CISPR22, Class A/CISPR24; International EN55022, Class A/EN55024; European FCC, Part 15, Class A; US Certification ICES-003, Class A; Canadian Certification AN/NZS 3548; Australian/NZ Certification BSMI: Taiwan — CNS 13438, Class A MIC: Korea — MIC, No. 2001-116 VCCI: Japanese Certification

Ordering Information

For further information, contact your local Nortel representative.

Nortel Ethernet Switch Power Supply Unit 10



Overview

The Nortel Ethernet Switch Power Supply Unit 10 is a scalable redundant power supply (RPS) and uninterruptible power supply (UPS) device that provides redundancy and power protection in a single chassis for Nortel Ethernet Switches and other network devices.

Ideal For

New and existing mid-tier and enterprise customers that need RPS and UPS functionality in a single chassis.

Business Challenges

- Is network uptime and uninterrupted activity critical to your business?
- Do you have multiple wiring closet switches?
- Are you in an area that experiences power sags, surges and blackouts?

Typical Applications

Any enterprise using Nortel Ethernet switches that requires a scalable redundant power supply and UPS system.

Key Points

- compact, all-in-one packaging. Single chassis, three rack-units high for standard 19-inch rack provides scalable, redundant power supply and UPS system for multiple devices
- Redundant Power Supply (RPS). Modules are available in 136-watt or 200-watt ratings to provide redundant dc power to up to four devices for each chassis
- optional UPS module. Available in 110-volt and 230-volt ratings, the optional UPS module provides battery backup ac power to up to four devices for each module or chassis
- flexible deployment. RPS and UPS can be purchased separately and installed into the chassis as needed, while unit remains fully operational
- integrated management. The SNMP Controller module (or integrated UPS/SNMP module) supports remote configuration, management, or reset
- lifetime warranty

Features and Benefits

- Provides redundancy for the power supplies of Ethernet Switches and other Ethernet devices to help ensure continuous network operation.
- Protects mission-critical enterprise applications from interruption due to problems with either the power source or power units within network devices.
- Enables on-demand deployment of UPS and RPS capabilities as enterprise needs grow, to extend the value of original system investment.
- Supports continuous operation as RPS modules are added or replaced.
- Has a single chassis, 3U high for standard 48.26 cm (19 in.) rack. Provides scalable, redundant power supply and UPS system for multiple devices.
- Provides redundant direct current power to one device for each module, four per chassis, with Redundant Power Supply (RPS) modules; UPS module provides battery backup ac power for as many as four devices for each module or chassis.
- Accepts up to four RPS modules per chassis, with rear slots available in two ratings.
- Supports Ethernet Switch 450 and other Ethernet devices such as hubs and routers that support the redundant power supply connector, with 136-watt modules (+12 V, -12 V, and +5 V output).
- Supports the Business Policy Switch with 200-watt modules (-48 V output).
- Add or replace hot-swappable RPS modules while the unit remains operational.
- Front slots in the chassis accept optional UPS and associated battery pack module, to provide uninterrupted ac power supply for up to four devices.

- North American UPS module supports 110-volt current; the international version supports 230-volt current.
- RPS and UPS can be purchased separately and installed into the chassis as needed while the unit remains fully operational.
- SNMP controller module or integrated UPS/ SNMP module manages and provides performance information.
- Power cables included with RPS modules connect to the Ethernet Switch 450 or other devices-or to the separately purchased dc-to-dc module required to support a Business Policy Switch.
- The Ethernet Switch 10 PSU can be remotely configured, managed, or reset using an SNMP MIB browser.
- Front-panel LEDs on management modules

indicate system power, RPS power, fan operation, and error codes obtained by SNMP.

- Ensures continuity of ac power to switches, hubs, and other network devices even during ac mains failure, power sag, surges, or blackouts.

Market Information

The Nortel Ethernet Switch Power Supply Unit 10 is a scalable redundant power supply (RPS) and uninterruptible power supply (UPS) solution that provides redundancy and power protection to existing and future network devices including Ethernet Switches 450, 460, 470, and router products. Ethernet Switch Power Supply Unit 10 is ideal for new and existing mid-tier and enterprise customers that need RPS/UPS functionality in a single chassis.

Technical Specifications

Interfaces	Standard ac wall plug- NEMA 5-15 P (ac in) dc connector Console (RS-232) connector Ethernet (RJ-45) port
Electromagnetic Compatibility	EN55022/CISPR 22, Class A EN55024/CISPR 24 ICES-003, Class A verified: Canada BSMI-Class A: Taiwan ACA, AS/NZ 3548, Class A: Australia FCC Part 15 Class A: U.S.
Shock/Vibration	IEC 721-3-3, 3M3; IEC 721-3-1, 1M3
Physical Dimensions	Width: 43.8 cm (17.25 in.) Height: 47 cm (18.5 in.) Depth: 13.3 cm (5.25 in.)

Power Requirements	Input requirements: Input voltage: North America: 100 V to 120 V; Europe: 230 V Input frequency range: North America: 57 to 63 Hz; Europe: 47 to 53 Hz Input current: 12.0 Amps, rms, max • Inrush current: 150 Amps peak maximum at cold start for a half cycle at any rated input voltage decaying to the nominal value within 100 milliseconds • Leakage current: 0.5 mA to 3.0 mA maximum for any input voltage Output requirements: Output voltage and current 136 W power supply module Output: —12, +12, +5 V dc Current (max.): 0.5, 2.5, 20 Amp 200 W power supply module Output: —48V dc Current (max.): 4.2 Amp Set point adjustment • 120 V ac, +/— 3 V ac (or 208 V ac or 220 V ac or 240 V ac +/— 6 V ac) under half load with batteries fully charged Output over voltage • ac outputs over voltage protected (OVP). The output OVP trip level preset to 135 V ac +/— 5 V ac, or 238 V ac, 250 V ac or 270 V ac +/— 10 V ac Hold-up time The output shall remain within its error band for 3 minutes minimum for fully loaded UPS, from a complete line loss. See RPS specifications for RPS Hold-up time Transfer time Less than 5 ms, phase locked to the utility waveform UPS voltage and current for North American version Input: 100/120 V ac, 12 A, 60 Hz Output: 120 V ac, 12 A, 60 Hz, 1400 VA, 1000 W, pf: 0.7 UPS voltage and current for International version Input: 230 V ac, 7 A, 50 Hz Output: 230 V ac, 7 A, 50 Hz, 1400 VA, 1000 W.
Environmental	Operating temperature: 0° to 40 °C (32° to 104°F) Storage temperature: 25° C to 70° C (—13° to 158°F) Operating relative humidity: 5% to 85% relative humidity, non-condensing Storage temperature humidity: 95% maximum relative humidity, non-condensing Operating altitude: Up to 3024 m (10 000 ft) above sea level Storage altitude: Up to 9144 m (30 000 ft) above sea level Cooling, forced air: 2X30 CFM, 80 mm fans
Standards and Certifications	UL 1778, UL/C-UL 1950, IEC 950/EN 60950, EN50091-1, CB certificate and report with all national deviations, TCA AS/NZS 3260, CCIB/GB4943, GB9254, KNITQ, JET, PSB, NOM-019-SCFI, GOST, IRAM

Ordering Information

For further information, contact your local Nortel representative.

Nortel Network Management

The Nortel Enterprise Network and Service Management (EMS) delivers strategies, solutions, and tools to enable a system-wide, life cycle management approach, dedicated to delivering converged solutions that reduce the total cost of ownership and that enhance the end-user experience. The solutions manage the real-time system and application performance for the end user.

Proactive Voice Quality Management (PVQM) provides a life cycle approach that delivers the necessary management tools to support each phase of an IP Telephony project: assessment, pre-deployment, ongoing monitoring, reporting, and diagnostics to help ensure successful implementation and ongoing management. The PVQM approach ensures a proper, cost-efficient, and rapid rollout resulting in a high-quality VoIP and multimedia solution. The unique ability of PVQM to monitor, measure, and maintain end-user voice quality in real time helps to ensure better Service Level Agreement (SLA) management and helps to ensure a low cost of ownership.

EMS applies true subscriber-based services that change the way service providers do business. EMS moves the traditional provisioning model from asset to subscriber-based, and one that reduces operational and ownership costs. This new model focuses on the needs of the end user, revolutionizes MAC management, delivery time, and throughput, thus allowing the service provider to focus on business to further enable the mobile work force.

Enterprise Policy Manager (EPM) is policy management software that allows network managers to control and secure access to network resources based on users, groups of users, and applications. Policies function as business rules that manage resource security and bandwidth, and prioritize traffic so network resources align with actual business priorities. Through policy management, resource distribution occurs to where and to whom it makes the most business sense. EPM supports and simplifies the implementation of Core Security Policies, Differentiated Services (DiffServ), and Quality of Service architecture. EPM filters, polices, and prioritizes traffic flows by automatically applying policies across the network at the network element level. Network managers can then work with policies at the network level without worrying about the complexities at the device level.

Enterprise Network Management System (NMS) is the end-to-end domain manager for the Nortel portfolio of converged solutions. NMS provides a fast, efficient way to manage and troubleshoot converged networks. With a comprehensive set of network visualization, discovery, fault, and diagnostic capabilities, managers can identify problems before they affect network services. Maintaining optimum user quality of experience in Web services, IP Telephony, and other business-critical applications is important. Enterprise NMS provides a consolidated network infrastructure tool for Nortel solutions.

Enterprise IP Address Domain Manager (ADM) offers a powerful, standards-based solution accessed from a single administrative interface in Windows and UNIX environments to administer and manage integrated and automated IP addresses, Domain Name Service (DNS), and Dynamic Host Configuration Protocol (DHCP) in enterprise networks.

- Nortel Enterprise Network Management System
- Nortel Enterprise Policy Manager
- Proactive Voice Quality Management
- Enterprise Subscriber Manager
- Nortel IP Address Domain Manager

Nortel Enterprise Network Management System (ENMS)



Overview

The Nortel Enterprise Network Management System (ENMS) delivers a converged network management solution by providing the network operators the ability to monitor the network and access different views of the network. These views are essential to reducing the time to identify network issues and whether the issues are data or voice related. The ENMS decreases the time needed to identify issues and the mean-time-to-repair issues. The ENMS provides a true end-to-end view of the converged network.

Ideal For

The Nortel Enterprise Network Management System is ideal for Enterprises that rely on their network infrastructure to deliver communication services and business applications.

Business Challenges

- How do you address service management issues as your enterprise network transitions to IP telephony and other converged applications?
- Do you experience lost productivity and missed opportunities because of network downtime?
- Can your current management solution efficiently handle the new business-critical applications and the complex network services and protocols they depend on?
- Are network performance and availability affected because of the time it takes to troubleshoot and correct network problems?

Typical Applications

The Nortel Enterprise Network Management System (ENMS) provides a fast, efficient way for enterprises to manage and troubleshoot networks that use Nortel products. With comprehensive discovery features, the ENMS provides a detailed view of the physical network and logical connections, including specific protocol visualization for multicast, unicast, and frame relay. The ENMS has fault correlation and diagnostic tools such as RMON analysis and real-time performance monitoring to help identify network problem location and cause to help improve network performance.

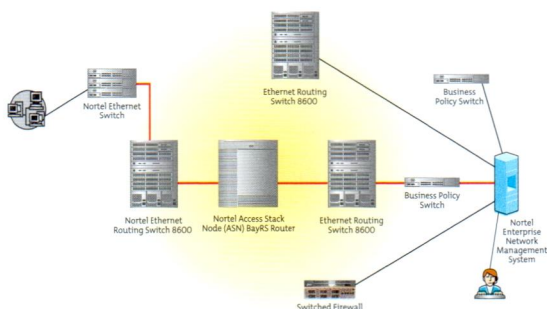
Proactive voice quality management (PVQM)

Proactive voice quality management (PVQM) is a solution Nortel co-developed with NetIQ that gives the network manager the capability to ensure the overall quality of IP telephony deployments. PVQM continuously measures the user quality-of-experience (QoE) for all IP telephony communications and conducts system health checks for IP telephony servers. PVQM provides troubleshooting and resolution for any performance degradation or fault conditions. Proactive voice quality management (PVQM) provides real-time, proactive notification and problem resolution of emerging voice quality problems while a call is ongoing, without user involvement or awareness.

IP Service Manager

The IP Service Manager is an advanced IP management module that allows network administrators to manage and troubleshoot IP telephony networks. The Nortel IP Service Manager performs within the framework of ENMS to provide integrated discovery, visualization, and troubleshooting of the registered Nortel IP Telephony end points on the Nortel Communications Server 1000 IP telephony system.

Network Diagram



Network diagram of typical deployment

Key Points

- Nortel ENMS offers functionality for managing complex multicast networks and support for the Nortel Switched Firewall product family. The Nortel Switched Firewall cluster view provides visualization of the Switched Firewall cluster and enables drill-down capabilities to identify members of the Nortel Switched Firewall cluster. Context-specific launch points facilitate the launch of third-party applications such as the CheckPoint SmartCenter Management Console.
- The device inventory manager helps network managers keep a complete inventory of their network devices. Critical information such as support contract details and precise physical location can be very useful when troubleshooting.
- Nortel ENMS provides powerful navigation tools that enable network managers to move seamlessly between logical and physical topology views with one mouse click.
- Nortel ENMS can support the performance, scalability, and security requirements for any size of network. Nortel ENMS can consolidate and correlate network faults from all supported devices, including the Nortel Communication Server Enterprise products that the Nortel Communication Server Manager administers.

Features and Benefits

- **Network discovery:** Nortel ENMS provides automated discovery and a detailed view of the physical network and logical connections between all Nortel devices, interfaces, and network services. Automated discovery includes physical discovery of hubs, switches, routers, IP telephony call servers, and gateways, Nortel Multimedia Communications Servers, Nortel Communication Servers, Wireless Security Switches and Wireless Access Points, Wireless Mesh network components, and multiple routerless subnets or IP ranges. Users have the flexibility to control the span of their discoveries and to discover elements on a per-device basis.
- **Fault management:** the intelligent fault engine in Nortel ENMS links the topology of the network to alarm conditions for consolidation and correlation of network faults, which helps the network manager quickly resolve fault or performance issues. Through different views, the operator can see how one component of the data network infrastructure relates to the voice network component.
- **Statistics and performance management:** Nortel ENMS includes performance analysis capabilities that extend from a network segment to an individual node, giving network managers the flexibility to track metrics on a

subnet basis, VLAN basis, protocol basis, or per-device basis. It displays real-time utilization statistics and performance metrics in a graphical or tabular format, and allows end users to customize polling and generate graphs for the use metrics.

- **Security management:** Nortel ENMS provides a user-centric security model that builds on community strings as well as SNMPv3 features. The use of Access control enforces user access in Nortel ENMS. The administrators control which users can use which applications and control access on a seed basis. Nortel ENMS uses SNMPv3 to secure element manager-device interaction. A community string editor sets SNMP community string information and SNMPv3 settings.
- **Inventory management:** the Nortel ENMS device inventory viewer (DIV) tracks Nortel Enterprise network inventories. Using DIV, network managers can track the physical and the contractual data for their network assets. DIV also has the flexibility to import and export inventory data.

Market Information

The following are customer comments about the Nortel Enterprise Network Management System:

"It gives me much more control of my network."

"When I use expanded view, it is just like standing in front of the device."

"The Web GUI is great to use when I am off-site and have to troubleshoot."

"With Nortel ENMS our surveillance, problem solving and troubleshooting are much easier."

"I can use it to shut down a port that is causing network problems, giving my technician's time to get on site and deal with the offending PC or server."

"The base lining capabilities really help me manage network health."

"The visualization capabilities have really helped me to train and empower my junior techs. Now I have more time for my work."

Technical Specifications

System requirements	Sun Sparc Systems Up to 5000 nodes: • Sun 2000 or Ultra 60 with 1.2 GHz CPU Over 5000 nodes: • SunFire V240, or Sun 2000 with 2.0 GHz CPU • 2 GB RAM minimum with 20 GB free disk space • Color monitor, CD drive, 1.44 MB 3.5-inch floppy disk drive (recommended) • Operating system: Solaris 2.8 Supported network management platforms: – HP Network Node Manager 7.0.1 for Sun Solaris – Tivoli TME 10 NetView 7.1.4 for Sun Solaris, Windows NT, 2000 or 2003
Campus	• Intel-compatible 1.2 GHz Pentium IV-type processor minimum • 1 GB RAM with 20 GB free disk space • Color monitor • CD drive
Enterprise	• Intel-compatible 2.0 GHz Pentium IV-type processor minimum • 2 GB RAM minimum with 20 GB free disk space • Color monitor, CD drive • Operating system: Windows NT Server or Windows 2000 or 2003 Server • Supported network management platforms: – HP Network Node Manager 7.0.1 for Windows NT/2000 – Tivoli TME 10 NetView 7.1.4 for Windows NT/2000

Client requirements	• Windows NT 4.0 Workstation, Windows 2000 or 3000 Intel compatible 512 MHz Pentium IV-type processor minimum • Professional, Windows 98, Windows XP • 512 MB RAM with 5 GB free disk space • Color monitor, CD drive • Browser support Internet Explorer 6.1, Netscape 7.x HP-UX systems • Server hardware for HP-UX Systems: – C3000 with 2.0 CPU – 412 MHz processor with 2 GB RAM minimum – Color monitor – 20 GB hard drive • Operating system: HP-UX 11i
Device support	• IP Telephony components: Nortel Communication Server, Business Communications Manager, Nortel Communication Server 1000 and Nortel Multimedia Communication Server 5100 (MCS 5100) • Ethernet Switches: Nortel Ethernet Switches, Nortel Business Policy Switch 2000, Nortel Ethernet Routing Switch 5000 series, Nortel Ethernet Routing Switch 8600 • Routers/Layer 3 devices: Nortel Ethernet Routing Switch portfolio, Nortel Multiprotocol Router portfolio, Nortel Communications Manager, Nortel Application Switch, Nortel VPN Router portfolio, Wireless Mesh Networking, Nortel WLAN portfolio • Optical Ethernet: Nortel Optical Metro Platform 1000 Series and 8000 Series • Other – System 5000 hubs, Centillion

Nortel Enterprise Policy Manager (EPM)

Overview

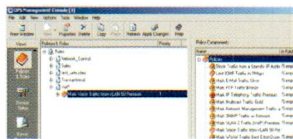
The Nortel Enterprise Policy Manager (EPM) is a single, network-level application that allows network administrators to manage network bandwidth, prioritize traffic streams, and set network access policies. Nortel EPM is part of a comprehensive Nortel Management solution that includes the ENMS for discovery, diagnostics, and troubleshooting; the Nortel Ethernet Switching Element Manager for online configuration of Ethernet switching devices; and Nortel Communication Server Manager for comprehensive enterprise voice management.

Ideal For

The EPM is suited to Enterprises that rely on their network infrastructures to deliver communication services and business applications.

Business Challenges

- Are you confident that you have the comprehensive security management needed to prevent external network attacks?
- Can you count on your current management solution to:
 - reliably deploy and maintain security protection policies?
 - ensure network-level admission control to protect against denial of service (DoS) and distributed denial of service (DDoS) attacks?
 - implement policies for access control, based on user profile and RADIUS authentication?
- Are you concerned about internal security violations that can result in network downtime and regulatory violations?
- Can your current management solution ensure quality of service (QoS) for new applications that place increasing demands on network bandwidth and network reliability?

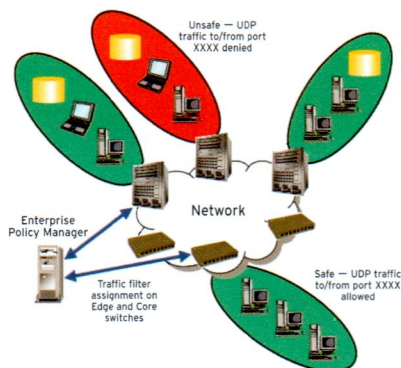


Typical Applications

Enterprise IT managers face increasing application demands. Businesses view their networks as strategic assets that must support dynamic business goals. This new reliance on their networks increases the sheer volume of traffic on networks and dictates new service parameters to ensure quality and availability for applications such as CRM, SCM, call centers, and IP telephony. Network managers faced with this trend and these demands must define policies that ensure sustainable network performance. They must also begin to build or redesign networks that can support applications and network-access security according to a policy-enabled service set.

Business justification for this activity is intuitive. By building or redesigning a network that supports policy-enabled control for quality of service (QoS) and network-access security, the network manager creates a flexible, optimized infrastructure on an application-by-application basis. This flexibility extends to the security domain as well, enabling the network manager to respond quickly and easily to new threats. With this inherent flexibility, the network manager can respond to the ever-changing business environment. With central control over network performance, or any new or existing application, the network manager can fine tune applications to improve performance and cost-effectiveness. These improvements can result in deferred costs for extra bandwidth or the ability to bring a new revenue or productivity application online quickly. In today's economy, time-to-money is a crucial business metric.

Network Diagram



Key Points

- Nortel EPM makes it easy to maximize current bandwidth use by simplifying traffic prioritization based on predefined rules or policies. Advanced packet classification and the ability to prioritize traffic streams and set network access policies deliver increased performance to support advanced applications or services without incurring additional bandwidth costs.
- Nortel EPM provides centralized application and user-based policy provisioning that enables rapid response to emerging threats.
- Nortel EPM with TrueControl from Rendition Networks provides consistent and scalable configuration control across multi-vendor networks to increase business uptime for enterprise customers.
- Nortel EPM and the Solsoft Policy Server improve processes and productivity by consolidating security policy management.
- Nortel EPM integrates alarms and statistics into the Nortel ENMS to correlate a policy violation with other network problems. Administrators can use the system to troubleshoot and diagnose the problem before it affects application performance.

Features and Benefits

- Quickly apply traffic filtering policies from a single console across multiple device types
- Prioritize business-critical traffic flows for effective bandwidth management and quality of service (QoS).
- Respond to network threats in minutes using broad network access control against denial of service attacks, viruses, and worms.
- Screen users logging into the network, especially from wireless or public connections such as schools, meeting rooms, or hospitals, using RADIUS authentication and EAP (802.1x) support.
- Implement user-based policies to ensure application-level authorization to access sensitive assets and data.
- Assess and control the effect of new policies on applications and services using closed-loop analysis tools.
- Create an IP telephony policy that marks and meters the voice traffic with the Nortel EPM auto-QoS software. For delay-sensitive applications like IP telephony, Nortel switching devices are preconfigured with default mappings for high-performance voice services. The EPM auto-QoS software reads these default mappings and creates the policy which can then be implemented on other devices throughout the network with one click.

- Retrieve information directly from the filter table in a network device and convert it into policy objects that can be used to provision similar devices with the Nortel EPM filter or policy import utility.
- Enhance network security and enable tracking of unauthorized filter changes. The Nortel EPM filter change alert enhances network security by signaling the network or security administrator whenever the actual network or device state is inconsistent with the expected state. The EPM also enables managers to track and correct unauthorized filter changes that could constitute a security breach or result in degradation of network performance.
- Provide scalability and reliability for large networks, and for interworking with various management standards such as diffServ, IEEE 802.1p, COPS-PR and LDAP using the standards-based architecture.
- Complement existing firewall implementations and IP-VPN devices by adding an extra layer

of protection to network resources with the advanced security provisioning capabilities.

- Nortel Enterprise Policy Manager device support includes Nortel Ethernet Switch 460, 470 and 5510, Nortel Ethernet Routing Switch 8300 and 8600, Nortel Routing software, Nortel Communication Server 50/200/400 and Nortel VPN Gateway.

Market Information

The following are customer comments about the Nortel Enterprise Policy Manager:

"It really works and is very powerful."

"To be able to limit traffic at the port level is really useful."

"Policy is implemented within 7 seconds."

"We ran our key applications on a high-priority queue and solved a number of problems. Nortel EPM made it easy to implement."

"I like the Web browser interface."

"The product has low overhead, almost negligible."

Technical Specifications

System requirements	UNIX environment Server hardware • UltraSparc 650 MHz with 512 MB RAM Operating system • Solaris 2.8, 2.9 Supported network management platforms • Enterprise Network Management • Tivoli TME 10 NetView • HP OpenView Network Node Manager Client device • Java Runtime Environment (JRE) v 5.0 is required Windows environment Server hardware • 1 GHz with 256 MB RAM Operating system • Windows 2000 or 2003 Server Supported network management platforms • Enterprise Network Management System • HP OpenView Network Node Manager • Tivoli TNM 10 NetView Client device (Windows XP or 2000 or 2003 Operating System) • 1 GHz with 256 MB RAM • Java Runtime Environment (JRE) v 5.0 is required
Device support	• Nortel Ethernet Switch 460 and 470 • Nortel Ethernet Switch 5510 or 5520 • Nortel Business Policy Switch 2.5, BoSS 3.0,3.1 (3.1.1 required for UBP support) • Nortel Ethernet Routing Switch 8300 and 8600 • Nortel Multiprotocol Routers • Nortel Communication Server • Nortel VPN Router Portfolio

Proactive Voice Quality Management (PVQM)

Overview

Proactive Voice Quality Management (PVQM) is a solution Nortel co-developed with NetIQ. PVQM gives the network manager the capability to ensure the overall quality of IP telephony deployments. PVQM continuously and passively measures the user quality-of-experience (QoE) for all IP telephony communications, conducts system health checks for IP telephony servers, and provides troubleshooting and resolution for performance degradation or fault conditions. PVQM provides real-time, proactive notification and problem resolution of emerging voice quality problems while a call is ongoing, without user involvement or awareness.

Ideal For

- Any customer who introduces IP Telephony into the network should be interested in tools to assure service levels through cost-effective management approaches.
- Medium and large enterprises who:
 - Implement a Nortel Communication Server 1000 4.0 IP Telephony and want to manage service quality down to the IP Phone level
 - need to monitor and report on service quality for IP Telephony
 - Have a network of Business Communication Managers and want a remote management solution providing rich performance-reporting capabilities
 - Want diagnostics tool sets to support their IP Telephony infrastructure

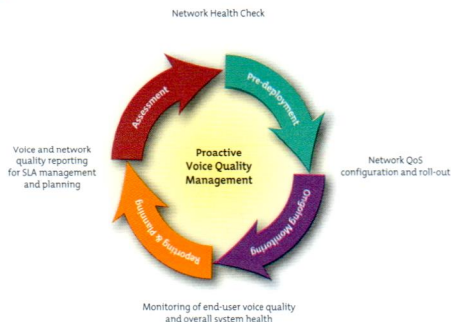
Business Challenges

- Are you interested in assessing your network to determine if it is ready to handle Internet Telephony?
- Are you looking for tools that can help you monitor the experience of your IP Telephony users and your network performance?
- Do you want a cost-effective solution for troubleshooting network problems in real-time?

Typical Applications

- VoIP Readiness Assessment and pre-deployment
- Monitoring and Reporting and Managing VoIP Availability and Quality Needs

Network Diagram



Key Points

- **End User Experience** : Focused on the end user Quality of Experience, PVQM provides the necessary tool sets to optimize operational processes, maximizing service up-time, thus providing the right focal point business operations.
- **Network Infrastructure Correlation**: the automated, expert trouble-shooter quickly pinpoints call quality problems in Voice over IP (VoIP) networks and easily explains why you experience reduced call quality.
- **Real-time Management**: manage voice quality in real-time as calls are in progress by using PVQM.

Features and Benefits

Successful implementation of VoIP applications requires integrated management solutions that allow you to control your entire voice network and server infrastructure. Understanding how data traffic affects voice applications, before deployment, and then continually monitoring and diagnosing the status of IP Telephony devices helps maximize success. For all stages of deployment, NetIQ products provide the most comprehensive solution available on the market. NetIQ delivers assessment, monitoring, and diagnostic products to ensure a successful implementation and to accelerate your overall return on VoIP investment. In addition, Enterprise Policy Manager and Enterprise Network Management System complement your investment in Nortel data solutions, providing point-and-click management of your converged network. These optimized tools remove costs from your business while ensuring IP Telephony service quality.

Because of the business-critical nature of voice service, activities such as deployment, monitoring, and troubleshooting for IP telephony require optimized tool sets to ensure you stay on top of your service quality needs. PVQM offers a number of a number of these tools.

- **NetIQ AppManager**: AppManager ensures ongoing VoIP performance, availability, and call quality. AppManager provides sophisticated Knowledge Scripts so you can work smarter by

monitoring critical resources and performance issues, and perform sophisticated troubleshooting activities automatically or behind the intuitive Web console interface.

- **NetIQ Vivinet Diagnostics**: Vivinet Diagnostics is an automated, expert troubleshooter that quickly pinpoints call quality problems in VoIP networks and easily explains why you experience reduced call quality. The Vivinet Diagnostics software reduces the time needed to resolve voice quality issues and lessens the skills required for VoIP troubleshooting in pre- and post-deployment environments. Vivinet Diagnostics can be invoked using synthetic IP clients today and can start automatically when a real-time R-value trap arrives from a CS 1000 system.

- **Nortel Enterprise Network Management System**: The ENMS is the end-to-end domain manager for the Nortel portfolio of converged solutions. ENMS provides a fast, efficient way to manage and troubleshoot converged networks with a comprehensive set of network visualization, discovery, fault, and diagnostic capabilities. ENMS helps managers identify problems before they impact network services. Maintaining optimum user QoE in Web services, IP Telephony, and other business-critical applications is important. Enterprise Network Management System provides a consolidated network infrastructure tool for Nortel solutions.
- **Nortel Enterprise Policy Manager**: EPM is a system level software application that manages traffic prioritization, Quality of Service, and network access security for business applications in the enterprise networking environment. Network managers can now take a proactive approach to bandwidth management, security, and prioritization of business-critical traffic flows across the organization. EPM supports network managers by providing centralized control of advanced packet classification and the ability to priority mark, police, meter, or block traffic. EPM is used to consistently deploy QoS provisioning across the network to support the needs of IP Telephony.

Market Information

The unique approach of PVQM spans all aspects of an IP telephony project from network assessment to the end user experience. PVQM is a solution that partners with industry leaders in network management tools to reduce total cost of ownership and to create a robust and comprehensive tool suite focused on measuring and delivering the highest voice quality in a converged network. PVQM measures voice quality from the end user experience and provides system feedback to ensure the ongoing quality level associated with a Service Level Agreement (SLA).

Enterprise Subscriber Manager



Overview

Enterprise Subscriber Manager is a powerful PC-based tool that simplifies, streamlines, and automates the management of Nortel PBX systems. With Enterprise Subscriber Manager, businesses can save time and money every day and help increase uninterrupted, quality phone service. Enterprise Subscriber Manager generates detailed reports on switch data and provides a single, easy-to-use interface to perform moves, additions and changes (MAC).

Ideal For

- small to large businesses that want to simplify and enhance the management of their Nortel Meridian 1 PBX and Nortel CS 1000 communications network
- small to large businesses that want to minimize downtime by using consolidated alarm view and alarm notification features
- businesses that require effective tools to monitor and report on network use, and to optimize performance and planning
- businesses that require LDAP integration to serve a variety of business applications in their networks

Business Challenges

- Today the management of assets and services is accomplished one element at a time. With large and small networks, this process can be complex, manually driven, and time-consuming. The Nortel approach is to simplify and automate management processes across the network and add an easy-to-use interface.
- The Nortel Enterprise Subscriber Manager simplifies provisioning methods by focusing on individual end user needs—not system requirements and constraints. ESM reduces the complexity of setup and deployment that fundamentally changes the way businesses provision and deliver quality of experience and reduce total cost of ownership.

Typical Applications

Enterprise Subscriber Manager provides the ability to:

- facilitate major switch implementation (even non-Nortel PBXs that support exporting data to a text file can import the switch data with Enterprise Subscriber Manager)
- move large groups of stations within or between PBXs

- populate new switches with ease
- provide callers with immediate help through the company's help desk

Key Points

- automates data extraction and reporting
- simplifies the interface with a logical approach
- provides ease of use with creation of templates for frequently used profiles
- eliminates manual data entry and errors with defaults that propagate to other fields
- facilitates MAC administration for creating, modifying, and deleting multiple stations

Features and Benefits

- **Multiple copy/move feature:** station configurations from old switches to new Nortel switches, making installations fast and accurate. Administrators can implement moves and copies of stations within one PBX or between PBXs for easy departmental moves or PBX expansions.
- **Single interface intuitive workflow:** The application within Enterprise Subscriber Manager is built with a business logic that improves the Quality of Experience. Administrators enter data once and that data then populates the targeted devices. This improvement results in fewer keystrokes, fewer errors and less troubleshooting.
- **Immediate or Scheduled global change:** When new services are available for general deployment, it can take weeks to roll out these services using traditional methods. Enterprise Subscriber Manager speeds this cycle by allowing the provisioning administrator to deploy immediately or schedule for another time and date. Enterprise Subscriber Manager applies global changes such as a network class of service upgrade to selected groups of stations. With the sorting and filtering functions

provided by Enterprise Subscriber Manager, it is easy to specify stations for upgrading.

- **Customizable Work Environment:** Enterprise Subscriber Manager allows administrators to customize their work environments.
 - Framework — This window contains all of the project views and monitors, as well as administrator, system, template, and report views.
 - Shortcuts — This window is similar to the desktop of a PC. It contains links to frequently used records.
 - System Lists — These lists contain a hierarchical view of all the systems licensed with Enterprise Subscriber Manager by system type. Records within the systems can be accessed by clicking the plus sign (+) next to the system.
 - Global Lists — When using multiple systems of the same type, these lists contain all records for each type of system.
- **Station Templates:** Create commonly used phone sets and associated settings, and save them for future use. Whether from scratch, from existing stations, or from text or spreadsheet files, administrators can efficiently create large numbers of stations while ensuring consistency of key layout, class of service attributes, and many other field values. Other Enterprise Subscriber Manager template features allow administrators to define multiple station configurations obtained from non-Nortel to Nortel switches, and rapidly populate switches when large numbers of employees move at the same time.
- **Tracking and Reporting:** Enterprise Subscriber Manager tracks and reports information that is normally hidden within the switch. When administrators delete or change a station, all other affected services are visible. The administrator can optionally change or delete the stations. With multiple modify you can make many changes at once.
- **Swap:** Swapping stations is fast and easy. Just select two terminal numbers and swap them using a menu bar command. Multiple

steps involving temporary moves are not necessary. Make chained moves with ease.

- **Multiple Move:** An office change often causes a series of sequential moves. An employee leaves the company, another employee wants the employee's office space, a third employee decides to move into the second employee's office space, and on it goes. With Enterprise Subscriber Manager's multiple move feature, chained moves are almost entirely automated.

Market Information

- Medium Enterprises - 250 to over 1000 subscribers
 - Centralized single administrator management
- Large Enterprises - 1000 to over 100 000 subscribers
 - Multiple administrators and multiple access levels
- Managed service providers
 - Management by customer
- Scheduled MAC requests

Technical Specifications

System recommendations	• Microsoft Internet Explorer 5 or newer • Pentium IV processor 2 GHz Intel-based or faster • Microsoft Windows XP with Service Pack 2 or 2003 Server • 512 MB RAM or more • CD-ROM drive • SVGA resolution graphics or better • Monitor with 256 colors and 800x600 resolution or better • Mouse • External or removable backup of the Enterprise Subscriber Manager database • Network connectivity • 10 GB hard disk space or more • One or more modems, RS-232 communications connections or network connections to send changes to managed systems
Client Workstations	• Pentium III processor 600 MHz Intel-based or faster • Microsoft Windows XP with Service Pack 2 or 2003 Server • 512 MB RAM or more • SVGA resolution graphics or better • Monitor with 256 colors and 800x600 resolution or better • 1 GB hard disk space or more • Microsoft Internet Explorer 5 or later
Enterprise Subscriber Manager Database Server/Communication Server PC	• Microsoft Internet Explorer 5 or later • Pentium IV processor 2 GHz Intel-based or faster • 1 GB RAM or more • Microsoft Windows XP with Service Pack 2 or 2003 Server • 10 GB hard disk space or more • Network access for client/server interactions through file sharing or TCP/IP with DNS (Domain Name Service) enabled. All PCs running Enterprise Subscriber Manager must be able to make a TCP/IP socket connection to the database server. Note: The connection is verified by using the "ping" command. • One or more modems, RS-232 cables or network connections for communication with the Communication Server 1000 (CS 1000) and branch office systems and a network connection to the LDAP subscriber database • Tape or network backup for the server
Compatibility	• Multimedia Communications Server 5100 Release 3.0 and 3.5 • Communication Server 1000 Release 3.0 and 4.0 (including survivable cabinet, media gateway and branch office) running on all supported platforms • Meridian 1/Communication Server 1000 support: – Navigation and system associations (main office, branch office) – Analog, digital, and IP phone sets – Corporate Directory feature support for M390x and IP Phone 20xx • Meridian M1 release support: – Release 23-25 running on Option 11C (including survivable cabinet and media gateway), 51c, 61c, 81/81C

Nortel IP Address Domain Manager

Overview

The Nortel IP Address Domain Manager software solution provides automated IP Address, DHCP, and DNS server management to increase IP network performance and availability and to lower costs associated with IP network management. IP Address Domain Manager lessens downtime by streamlining IP address management. In addition, the software supplies innovative tools to simplify Domain Name Service (DNS) and Dynamic Host Configuration Protocol (DHCP) management.

The Nortel IP Address Domain Manager software solution allows network managers to control IP addressing and standards-based DNS and DHCP services from a common interface, increasing the efficiency of management personnel and reducing the possibility of errors. Simplifying IP addressing is at the core of Nortel IP Address Domain Manager functionality. By providing a central platform from which an entire IP address domain is managed, the software enables static addresses, dynamic addresses, and IP Address Domain Manager DNS and DHCP Servers to be effectively managed with one another. Nortel IP Address Domain Manager also removes major technical barriers to DHCP implementations by supporting dynamic DNS (DDNS) updates and DHCP redundancy at every level of the product.

Ideal For

The Nortel IP Address Domain Manager is suited to organizations that are looking for an effective way to automate the management of their IP address domains

Business Challenges

- Is your business running out of IP address space?
- Is your business having difficulty keeping accurate records of the IP addresses assigned?
- Does your organization need a better method to reclaim statically assigned addresses that

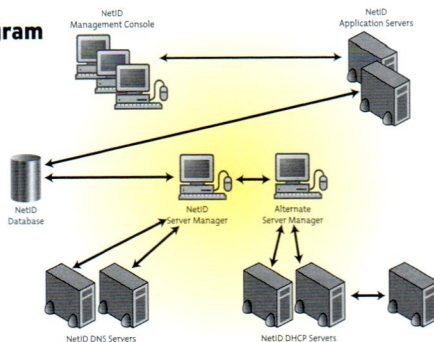
are no longer in use?

- Does your organization have to manually update DNS information and configure devices that need access to the network?

Typical Applications

Nortel IP Address Domain Manager is suited to growing enterprises that are increasingly relying on IP services and IP-enabled devices in business applications. As the size of your IP address domain increases, it is essential to find more reliable and cost-effective ways to manage it; this is where IP Address Domain Manager is valuable.

Network Diagram



Key Points

- simplifies IP address management by providing system-level control, to ensure that address conflicts are corrected and updated address availability information is supplied
- supports dynamic DNS updates to ensure that lookup information for domain names is updated automatically across the network
- offers high network availability by eliminating downtime caused by IP address conflicts
- delivers centralized control with distributed management capabilities using an intuitive, browser-based interface

Features and Benefits

The Nortel IP Address Domain Manager is a software solution that consists of the following components:

- **Database:** IP addressing information is stored in the IP Address Domain Manager database (a Sybase or Oracle database). Multiple users can access this information from the management console.
- **Management Console:** Provides an intuitive platform for IP address management and DNS and DHCP server management. From the Java-based interface managers can access the central database from Web browsers. Administrators can customize the views to see networking information according to the fields they want displayed. For example, DHCP configuration is viewed by either server or subnet.
- **Application Server:** Generates Management Consoles through which network administrators can view and modify the information stored in the database. The Application Server commits network, subnet, host, DNS, and zone parameters specified by the administrator to the database. It also provides managers with updated network, DNS, and DHCP information.
- **Server Manager:** The interface between the DNS and DHCP servers and the central database. Server Manager provides the servers with their initial configuration and sends incremental configuration changes to servers across the network. The Server Manager is commits DNS and DHCP information to the database.

- **DNS Server:** Linked to the database by the Server Manager, the DNS server supports standards-based DDNS updates and DNS reconfiguration (changing server policy and zone structure). The DNS Server is based on BIND 9.x and interoperates with other BIND-compliant DNS Servers.
- **DHCP Server:** A BootP/DHCP server that is configured from the Management Console. The DHCP server automatically assigns IP addresses and names to specified hosts.

Product Features Include:

- **High Network Availability:** IP Address Domain Manager features an approach that delivers built-in fault tolerance at every level, enabling managers to correct network problems before a major outage occurs. Alternative Server Managers can be configured to maintain an open connection to the database. If a WAN or database outage occurs, each component continues to function independently. DNS and DHCP Servers operate using their local configurations and then automatically update the database as soon as the outage is corrected. In addition, the DNS and DHCP Servers generate alarms and warnings that are made available to the managers from the Management Console. If an isolated server outage occurs, system backup is provided by DHCP redundancy and a fault-tolerant DNS Server, allowing isolated outages to remain transparent to end users.
- **Integrated IP Address, DNS, and DHCP Management:** The Management Console provides a common management point from which IP address, DNS and DHCP information perform essential management tasks such as moving IP addresses, entering domain names, and adding new subnets from the intuitive graphical interface of the Management Console. Parameters for the DNS and DHCP Servers from the Management Console and store the information in the database. Servers obtain their configuration from the IP Address Domain Manager database through the Server Manager, providing a single configuration point for servers across the network.

- **Active Server Management:** The IP Address Domain Manager Active Server Management feature supports status monitoring of individual DNS and DHCP servers, with the Management Console providing a display of the configuration and real-time status of the servers. The Management Console serves as a collection point for alarms and warnings from the DNS and DHCP servers. The alarms generate Simple Network Management Protocol (SNMP) traps monitored by other applications in the network management software suite.
- **Web-based Management Console:** The Management Console is displayed as a window generated from a Java-enabled Web browser. Immediate access to the central database ensures currency of information and prevents duplication of effort among management. The cross-platform capability of Java allows use of the IP Address Domain Manager across the enterprise environment.
- **Centralized Control with Distributed Management:** IP Address Domain Manager features flexible access controls that support distributed management of IP addressing tasks. Users obtain access rights that restrict access to specified subnets, subdomains and ranges, limiting their access to the IP addresses that are their direct responsibility.
- **Personal Views:** In addition to limiting the information that users can modify, network managers can also limit the information users can see. The only information users can see is data that the IP Address Domain Manager administrator places in their personal view.
- **Ease of Use:** The Management Console provides an intuitive, user-friendly tool for IP address management as well as DNS and DHCP management. Information is presented graphically and organized hierarchically, and custom views enable network administrators to view information according to specific fields.
- **Persistent Dynamic DNS Updates:** The DNS server saves to a disk any DDNS updates it receives to help ensure that data is not lost when it is committed to the database. Interruptions of the transfer of DDNS updates to the database can occur if the DNS server restarts or if it receives configuration from the database. The DNS server resumes its normal operation, it refers to its local record of DDNS information and reattempts to commit any unconfirmed records to the database using the Server Manager.
- **DHCP Redundancy:** Using DHCP redundancy, the IP Address Domain Manager helps to ensure high availability of DHCP services. With a primary and a backup DHCP Server maintaining the same address ranges, DHCP clients can obtain an IP address even if the primary server is unavailable.
- **Dynamic Addressing:** IP Address Manager controls the allocation of DHCP addresses by associating pools of client IDs or Media Access Control (MAC) addresses within a DHCP range. Only members of the client pool can receive an address from a DHCP range associated with a client pool.
- **IP Audit Tool:** Network administrators can compare the addresses stored in the database with those currently in use. IP Address Manager checks all data as it is entered, and the IP Audit Tool is available to verify data at any time. Administrators can delete unused addresses or retrieve them for reassignment. The system automatically adds newly detected addresses to the database..
- **Automated VLSM Design:** IP Address Manager automatically calculates subnet masks, eliminating the common errors associated with VLSM (Variable Length Subnet Mask) design and architecture.

Market Information

The IP Address Management (IPAM) market is defined to include graphical user interface (GUI), IP address management, and DNS and DHCP configuration and management functions in either a software or appliance solution. This dynamic global market is estimated at \$220 million in 2005 (Forrester) and is expected to continue rapid growth as more IP addresses

become active. The use of IP address space is accelerating as more IP-enabled devices are deployed (IP phones, 3G wireless, mobile computers, PDAs). The market also anticipates growth to be fueled by the widespread adoption of IPv6, which is expected to occur first in Asia and in certain vertical segments such as the military.

Technical Specifications

Product	Disk Space	Memory	Platform	Hardware
ADM DHCP Server	4 GB	500 MB	Windows 2000, 2003 Solaris 2.8, 2.9, 2.10 HP-UX 11i	Pentium III 500Mhz SUN UltraSPARC HP
ADM DNS Server	1 GB	500 MB	Windows 2000, 2003 Solaris 2.8, 2.9, 2.10 HP-UX 11i	Pentium III 500 Mhz SUN UltraSPARC HP
ADM Application Server	1 GB	1 GB	Windows 2000, 2003 Solaris 2.8, 2.9, 2.10 HP-UX 11i	Pentium III 500 Mhz SUN UltraSPARC HP
ADM Server Manager	4 GB	1 GB	Windows 2000, 2003 Solaris 2.8, 2.9, 2.10 HP-UX 11i	Pentium III 1 GHz SUN UltraSPARC HP
Oracle 9i Oracle 10g	650 MB + 2 KB per IP address	256 MB	Any platform	As supported by database vendor
Sybase 12.5.x Server	500 MB + 2KB per IP address	512 MB	Any platform	As supported by database vendor

Ordering Information

For further information, contact your local Nortel representative.

Nortel Multiservice Switches Portfolio

The Nortel Multiservice Switches portfolio enables enterprises with multiple disparate networks an affordable means to have flexible, reliable, secure LAN and WAN networks that offer superior voice quality and business-grade IP services. Nortel Multiservice switches provide high network availability and reliability for end-to-end Quality of Service (QoS) when enterprises converge over multiple networks. Nortel Multiservice Switch products optimize network resources and incorporate leading-edge features and products into enterprise networks that carry the network into the future. The Multiservice Switches portfolio comprises the following switches:

- Nortel Multiservice Switches
- Nortel Multiservice Switch 7400 series
- Nortel Multiservice Switch 15000

Nortel Multiservice Switches

Overview

To build separate networks for voice, video, and data is costly and inefficient. Nortel Multiservice Switches offer a reliable and secure wide-area network platform to deliver mission-critical applications such as voice, data, and video and include Ethernet, frame relay, asynchronous transfer mode (ATM), and IP-VPNs over a single, cost-effective, reliable infrastructure. The Nortel Multiservice Switch offering comprises the following switches:

- The Nortel Multiservice Switch 7400 series (7420, 7440, 7460, and 7480) offers enterprises with multiple disparate networks an affordable means to have flexible, reliable, secure LAN/WAN networks that offer superior voice quality, business-grade IP services, and end-to-end QoS. The Nortel Multiservice Switch 7400 series is an ideal solution for the challenges that arise in enterprise networking environments. The Nortel Multiservice Switch 7400 offers value-added functionality such as multiservice access technology to provision multiple services on a single functional processor (FP), high-density voice networking, and voice transport. The Nortel Multiservice Switch 7400 is ideal for corporations with distributed contact centers that need reliable, high-quality, real-time voice transmission across international circuits. The Nortel Multiservice Switch 7400 series provides virtual IP routing that corporations can use to deploy scalable, embedded IP routing over ATM with class of service (CoS), and QoS. Enterprises can use the Nortel Multiservice Switch 7400 series to deploy private network-based IP-VPNs to segregate traffic at Layer 3 (departments, ministries, network applications) over a shared infrastructure. Corporations can evolve to multiprotocol label switching (MPLS) if it makes business sense.
- The Nortel Multiservice Switch 15000 offers a solution for enterprises that requires high capacity and trunk speeds up to STM-16/OC 48 bandwidth. Nortel Multiservice Switch 15000 supports ATM, frame relay, IP-VPN, MPLS, circuit emulation, Ethernet (E-Line, E-LAN), and voice services. The Nortel Multiservice Switch 15000 is suited to be a backbone platform. The Multiservice Switch 15000 is integral to the design of a high-capacity, versatile, reliable, and scalable solution to provide carrier-grade performance for core switching. The Nortel Multiservice Switch 15000 uses the same software stream, has common network management tools, and has the same look and feel as the Multiservice 7400 series, making the transition to high-capacity requirements seamless.
- Nortel Multiservice Switches use the Nortel Multiservice Data Manager (MDM) as their management system. This open, flexible management system provides comprehensive fault management, simplified end-to-end provisioning, and detailed configuration management. The MDM is the tool for organizations to integrate or expand the Multiservice Switch into their networks and to run the operating environment for their networks.

Enterprises can use the MDM to view and manage each Multiservice Switch node as one of many integrated elements within their networks. The MDM uses a consistent network view for alarm notification and display systems. The MDM can activate applications to perform tasks such as configuration management (provisioning, software distribution, and software backup and restore), fault management, accounting management, statistics management, security management, and network synchronization.

Enterprises can take advantage of the new MDM Operator Client, a secure desktop environment that MDM applications can use to run on Windows or Solaris workstations. Operator Client accesses the MDM

Server to manage network devices and provides improved low-cost performance for either local or remote access. The client software is deployed from the MDM Solaris server to the client using Java Web Start (JWS) technology, thus reducing installation and administrative overhead by providing automatic deployments and upgrades. The centralized User Administration Server infrastructure provides administration of a client's user ID and password information as well as access control permissions for users.

Ideal For

- Nortel Multiservice Switch 7400 series is suitable for:
 - organizations that want network convergence of voice, video, LAN, and data traffic over a common network infrastructure
 - enterprise sectors such as finance, insurance, utilities, transport, railways, air traffic control, police, emergency services, government networks, and defense networks
 - organizations with mission-critical applications that require little or no downtime
 - organizations with distributed contact centers that are looking for a high-quality, packetized voice solution to save on facility costs
 - large organizations or government agencies that need Layer 3 traffic segregation (department, government ministry, or network application) over a common infrastructure
- Nortel Multiservice Switch 15000 is suitable for:
 - large enterprise sectors (finance, government, and utility)
 - users who require a large backbone network with interfaces that range from channeled DS3/E3 to STM-16/OC-48
 - large enterprises with mission-critical traffic requiring a true carrier-grade switch

Business Challenges

- Is cost control a top networking priorities?
- Do you currently run multiple services across multiple WAN links?
- Do you have a nationally or internationally distributed network?
- Is network reliability important?
- Do you have a private PBX network with tie lines?
- Is your PBX network one of your highest operational costs?
- Do you have a distributed call center where reliable call handling is a necessity?
- Do you want to save money in facility costs?
- Do you want a solution that will optimize your bandwidth requirements?
- Are you a government agency that wants to facilitate transactions and information sharing between departments and that wants a private network-based IP-VPN solution?
- Do you want high-bandwidth solutions (E3/DS3 to STM-16/OC-48) to meet your customer requirements?
- Is a multiservice core switch beneficial to your business?

Nortel Multiservice Switch 7400 Series



Typical Applications

- T1 grooming at headquarters
- WAN for international contact center
- backbone switching solution for branch access
- voice and fax networking for PBXs
- Ethernet connectivity
- IP routing with CoS and QoS
- private network-based IP-VPN services
- Layer 2 connectivity (for example, ATM or frame relay) for existing data equipment or network
- video conferencing

Key Points

- **Network convergence:** Nortel Multiservice Switch 7400 provides convergence for ATM, voice, fax, video, LAN, and data services across a single network link.
- **Bandwidth savings:** Nortel Multiservice Switches reduce bandwidth use through dynamic bandwidth allocation, voice (8 K) and data compression, silence suppression, fax demodulation, and optimized LAN access protocols.

- **Superior voice quality:** Nortel Multiservice Switches provide TDM voice quality over ATM to support a wide range of signaling protocols, CODECs, voice features, CoS, and priority queuing.
- **QoS optimization:** Nortel Multiservice Switches support multiple priority system (MPS) to allow dynamic traffic management based on application characteristics and QoS priorities.
- **Scalability:** The high-density DS1/E1 MSA32 FP and the four-port DS1/E1 MVPe FP provide scalable, flexible, cost-effective multiservice and voice solutions. Network-wide, Nortel Multiservice Switch 7400 can support thousands of nodes.
- **Low cost of operations:** Nortel Multiservice Switch 7400 supports switched virtual circuits to avoid a large number of provisioned connections and to dynamically provide the best available traffic path.
- **Capacity:** Nortel Multiservice Switches PVG converts conventional circuit-switched voice traffic to packet voice for Succession network evolution.

Features and Technical Specifications

ATM services	SVCs, SPVPs, SPVCs, PVPs, and PVCs UNI 3.0, 3.1, 4.0 with interworking LMI 4.0 Point-to-multipoint (logical and spatial) Inverse multiplexing over ATM (IMA) n x DS-1/E1 Virtual Path Termination (VPT)
ATM traffic management services	ATMF service categories: CBR, VBR (rt/nrt), UBR, UBR with MDCR Shaping and UPC enhancements Dual leaky bucket traffic shaping (inverse UPC) and UPC Separate statistics for GCRA1 and GCRA2 UPC violations
Congestion management	EPD/PPD/LPD, W-RED (per connection, virtual circuits in virtual path) AAL5 autodetection
Advanced queuing and scheduling	Eight quality-of-service classes for each link or channel Per-connection WFQ (weighted fair queuing) for each class
Performance monitoring	Cell loss ratio, availability ratio, cell transfer delay
ATM networking	PNNI, AINI, IISP SPVCs and SPVPs across UNI, AINI, PNNI, and IISP interfaces H-PNNI support PNNI DBR (domain-based rerouting) PNNI path and connection trace Specified paths over PNNI and H-PNNI PNNI over IMA
MPLS networking	Signaling (LDP-DU, RSVP) Routing protocols (OSPF, IS-IS)
Circuit emulation services	ATM CES 2.0 (AAL-1) Structured and unstructured services PVCs, CES signaling over SVCs and SPVCs
Ethernet services	Bridged Ethernet over ATM (E-Line) Ethernet VLAN and port cross-connect capability Ethernet policing and p-bit aware QoS
IP support	IP-VPNs for intranet service, VPN access IP class of service Differentiated Services (RFC 2474) Routing protocols: OSPF, RIPv2, BGP-4, IS-IS IP-VPN over ATM (RFC2764) or MPLS (RFC 2547) VLAN Virtual Router Redundancy Protocol (VRRP) IP accounting IP Policing MD5 authentication for OSPF, BGP, LDP
Frame relay services	FR UNI and NNI (FRF.1, FRF. 2) (ITU-T, ANSI, Frame Relay and Vendor Forum) Frame relay usage-based accounting and detailed statistics X.121 and E.164 addressing schemes PVCs and SVCs Closed user groups, signaled per DLCI and per port SVC call redirection and hunt groups (FRF.4) FR-ATM service and network interworking (FRF.8 and FRF.5) Fragmentation and reassembly for delay reduction (FRF.12)

Packet voice services	VoATM (AAL-1 or AAL-2) and VoIP options Toll-quality voice encoding, ITU-T G.711 PCM, G.726 ADPCM or G.729 CS-ACELP Silence suppression, comfort noise generation and dynamic downsampling Congestion management 56/64 Kb/s clear-channel fax and modem support ITU-T G.165- and G.168-compliant echo cancellation; ITU-T G.164- and G.165-compliant tone detection ETSI QSIG, Euro ISDN, NIS, CAS, and MCDN signaling 5
Interfaces	Control Processor with or without BITS interface
ATM UNI/NNI interfaces	8-port DS1/E1 IMA 3-port DS3/E3 2-and 3 port OC-3/STM-1 Single Mode and Multimode 2-port STM-1 electrical 2-port STM-1 electrical channelized (ATM, IMA, CES)
Circuit emulation	4-port DS1/E1 AAL1 2-port STM1 electrical channelized
Ethernet interfaces	6-port 10 Base-T 2-port 100 Base-T 4-port 10/100 Base-T 8-port 10/100 Base-T
Frame relay interfaces	8-port V.35 8-port V.11 4-port E1 4-port DS1/E1 channelized 8-port DS1 1-port DS3/E3 1-port DS3 channelized 1-port HSSI
Multiservice access interface	Any service including ATM, FR, FRATM, FR-NNI, FR ISDN dial-up, HTDS, AAL1 CES and IP, any channel 32-port DS1/E1 channelized 32-port DS1/E1 channelized with dual STM-1/OC-3 ports (single mode, multimode) 32-port DS1/E1 channelized single slot
Voice interfaces	1-port DS1/E1/TTC2M 4-port DS1/E1/TTC2M Voice service processor AAL2
TDM interfaces	2-port DS3/E3c 32-port E1
Server cards	VPN Extender
Architecture and capacity	Multiprocessor architecture – Multiservice Switch 7480: 16-slot shelf, variant – Multiservice Switch 7460: 8-slot shelf, variant – Multiservice Switch 7440: 5-slot shelf, variant – Multiservice Switch 7420: 3-slot shelf, variant 1.6 Gb/s load-sharing bus architecture

Packaging	Multiservice Switch 7420 (dc only) Complete shelf unit dimensions: Height: 13.3 cm (5.25 in.) Width: 40.6 cm (16 in.) Depth: 53.3 cm (21 in.) Multiservice Switch 7440 Complete shelf unit dimensions: Height: 44.5 cm (17.5 in.) Width: 26.7 cm (10.5 in.) Depth: 55.9 cm (22 in.) Cabinet dimensions: Height: 196.9 cm (77.5 in.) Width: 61 cm (24 in.) Depth: 69.3 cm (27.3 in.) Multiservice Switch 7460 (dc only) Complete shelf unit dimensions: Height: 35.6 cm (14 in.) Width: 48.3 cm (19 in.) Depth: 49.5 cm (19.5 in.) Multiservice Switch 7480 Complete shelf unit dimensions: Height: 38.25 cm (9.72 in.) Width: 19 cm (4.83 in.) Depth: 21.75 cm (5.53 in.) Cabinet dimensions: Height: 196.9 cm (77.5 in.) Width: 61 cm (24 in.) Depth: 69.3 cm (27.25 in.) Seismic cabinet (NEBS Zone 4): Height: 197 cm (78 in.) Width: 60 cm (24 in.) Depth: 79 cm (31 in.) Universal Frame: Height: 220.1 cm (83.66 in.) Width: 60 cm (23.62 in.) Depth: 60 cm (23.62 in.)
Mounting options	Nortel-supplied cabinet or standard 19 in. EIA/IEC rack power –48 V dc/–60 V dc nominal voltage ac power option available
Standards compliance	Safety CSA C22.2 no. 950, EN 60950, UL 1950 EMC EN 55022/FCC Part 15B Class A, EN 50082-1 Seismic Up to Zone 4

Nortel Multiservice Switch 15000



Typical Applications

Nortel Multiservice Switch 15000 supports similar feature sets as those available on the Nortel Multiservice Switch 7400 platform (same software stream), but with high-density and high-speed interfaces. Typical applications include:

- high-capacity backbone switching for existing Nortel Multiservice Switch 6400/7400 networks
- IP routing with cost of service (CoS) and quality of service (QoS)
- private network-based IP-VPN services for traffic segregation at Layer 3 (by departments, ministries, network applications) over a shared infrastructure
- next-generation voice for core networking and packet voice gateway (PVG) VoIP or VoATM applications and full integration into the Nortel voice over IP Communication Server portfolio offering next-generation voice solutions
- next-generation wireless for multiple access aggregation and packet core solutions that enable GSM, TDMA, and CDMA networks to seamlessly evolve to 2.5-G and 3-G networks, those being GPRS, UMTS, and CDMA2000
- DSL aggregation to easily handle high-volume traffic while preserving multiple QoS levels for simultaneous applications (voice and data over DSL)
- TDM traffic grooming to support channeled circuit emulation services (CES) and to provide an opportunity to displace legacy DCS solutions
- optical Ethernet extension services across a WAN
- Multiservice over MPLS for rich network convergence options with the ability to "future proof" networks at a pace specific to the organization
- Layer 2 WAN that works with traditional WAN technologies such as frame relay with emerging Ethernet-based services

Key Points

Nortel Multiservice Switch 15000 offers a high-capability backbone solution with low complexity and capital costs, added access options, and peace of mind through a proven, highly secure solution.

- **Proven Reliability:** Designed to meet the most stringent networking needs, the Nortel Multiservice Switch 15000 provides equipment redundancy, hitless switchover, 1+1 protection for optical interfaces and 1:N sparing for electrical interfaces. A distinguishing feature is that Multiservice Switch 15000 supports hitless software upgrades for ATM media, eliminating one of the largest contributors to network downtime.
- **Profitability:** Nortel Multiservice Switch 15000 is unique in its ability to provide advanced ATM, frame relay, IP-VPN, MPLS, Ethernet, and circuit-switched voice services on a single platform that reduces ownership costs.
- **Platform evolution:** Nortel enables convergence of data, packet voice, and wireless networks with interoperability options between key technologies (FR, ATM, IP/MPLS, Ethernet) so that a network can evolve at a pace specific to the customer.

Market Information

Nortel was the global market share leader in multiservice switching revenue for 18 consecutive quarters as of year-end 2005, according to Synergy Research Group. With more than 45 000 systems shipped to over 1500 customer networks, The Nortel Multiservice Switching family has proven field experience in delivering carrier-grade reliability and service flexibility for mission-critical enterprise and service provider networks worldwide. Nineteen countries, countless municipalities, and government agencies around the world rely on the Nortel Multiservice Switch portfolio to protect critical data while reliably delivering services and information to their citizens.

Features and Technical Specifications

Multiservice Switch 15000

Dimensions	Height: 212.5 cm (83.66 in.) Width: 60 cm (23.62 in.) Depth: 60 cm (23.62 in.)
Standards compliance	Bellcore: GR-1089 core, GR63-core Safety : CSA C22.2 no.950, EN 60950, UL1950 EMC: EN 55022/FCC Part 15B Class A Seismic: Up to Zone 4
Power	48 V dc/-60 nominal voltage
Interfaces	ATM UNI/NNI interfaces: Unchannelized – DS-1/E1, IMA (nxDS1/nxE1), J2, DS-3/E3, OC-3c/STM-1, OC-12c/STM-4, OC-48c/STM-16 Channelized – DS-3, STM-1 Frame relay interfaces V.11, V.35, HSSI, DS-1/E1, DS-1ch/E1ch, DS-3, DS-3ch, STM-1ch IP interfaces: Ethernet: 10/100 Base-T and Gigabit Serial interfaces: V.11, V.35, HSSI, DS1/E1, DS3/E3 and STM-1 Optical interfaces: OC-3/STM-1, OC-12/STM-4, OC-48/STM-16 VPN Extender Card circuit emulation and voice interfaces: DS-1/E1, DS-1ch/E1ch, DS-3, DS-3ch, DS-3ch TDM, DS-3, OC-3/STM-1 Structured and unstructured Multiservice access interface: MSA32, any service, any channel
ATM services	SVCs, SPVPs, SPVCs, PVPs, and PVCs UNI 3.0, 3.1, 4.0 with interworking ILMI 4.0 Point-to-multipoint (logical and spatial) ATM (IMA) n x DS-1/E1 VPT (Virtual Path Termination)
ATM traffic management services	CBR, VBR (rt/nrt), UBR, UBR with MDCR
Shaping and UPC capabilities	Dual leaky bucket traffic shaping (inverse UPC) and UPC Separate statistics for GCRA1 and GCRA2 UPC violations
Congestion management	EPD/PPD/LPD, W-RED (per connection, virtual circuits in virtual path) AAL5 autodetection Eight QoS classes per link or channel Per-connection WFQ (weighted fair queuing) for each class
Performance monitoring	Cell Loss Ratio (CLR), Availability Ratio (AR), Cell Transfer Delay (CTD)
ATM networking	PNNI, AINI, IISP SPVCs and SPVPs across UNI, PNNI, AINI, and IISP interfaces H-PNNI support PNNI DBR (domain-based rerouting) PNNI path and connection trace Specified paths over PNNI and H-PNNI PNNI over IMA
MPLS networking	Signaling (LDP-DU, RSVP) Routing protocols (OSPF, IS-IS)

Ethernet services	Bridged Ethernet over ATM (E-Line) Ethernet VLAN and port cross-connect capability Ethernet policing and p-bit aware QoS
IP support	IP-VPNs for intranet service, VPN access IP class of service Differentiated services (RFC 2474) Routing protocols: OSPF, RIPv2, BGP-4, IS-IS IP-VPN over ATM (RFC2764) or MPLS (RFC 2547) VLAN Virtual Router Redundancy Protocol IP accounting IP policing MD5 authentication for OSPF, BGP, LDP Ethernet line service
Circuit emulation services	ATM CES 2.0 (AAL-1) Structured and unstructured services PVCs, CES signaling over SVCs and SPVCs
Voice services	VoATM (AAL-1 or AAL-2) and VoIP options Toll-quality voice encoding, ITU-T G.711 PCM, G.726 ADPCM or G.729 CS-ACELP Silence suppression, comfort noise generation and dynamic downsampling Congestion management 56/64 Kb/s clear-channel fax and modem support ITU-T G.165- and G.168-compliant echo cancellation: ITU-T G.164 and G.165-compliant tone detection ETSI QSIG, Euro ISDN, NIS, CAS and MCDN signaling
Frame relay services	FR UNI and NNI (FRF.1, FRF. 2) ITU-T, ANSI, frame relay and vendor forum Frame relay usage-based accounting and detailed statistics X.121 and E.164 addressing schemes PVCs and SVCs Closed user groups, signaled per DLCI and per port SVC call redirection and hunt groups (FRF.4) FR-ATM service and network inter-working (FRF.8 and FRF.5) Multilink Frame Relay (FRF.16) Fragmentation and reassembly for delay reduction (FRF.12)

Ordering Information

For further information, contact your local Nortel representative.

Nortel Multiprotocol Router Portfolio

The Nortel Multiprotocol Router portfolio provides wide-area network connectivity for small and large networks. High performing, scalable, and cost-effective, these solutions provide robust routing demanded by small enterprises and remote offices as well as network centers that support an extended network.

The Nortel Multiprotocol Router 2430 is a compact branch office router, ideal for a small branch office. The Nortel Advanced Remote Node Router is designed for small to medium remote sites that require multiprotocol LAN and WAN connectivity to support LAN-based client/server and legacy SNA traffic. The Nortel Multiservice Access Switch 4400 Series (formerly known as Nortel Passport 4400) provides powerful, efficient, and reliable solutions to cost-effectively and efficiently support new business applications. The Nortel Multiprotocol Router 5430, which supports numerous mission-critical applications, provides high-performance routing capabilities for large, bandwidth-intensive remote offices. In addition, growing remote offices and enterprise network centers value the Nortel Access Stack Node Router that supports up to 50 000 packets per second on 12 network interfaces. The Nortel Backbone Node Router line delivers all types of data across various network topologies for mid-range and large enterprise networks with large regional and headquarters sites.

The Nortel Multiprotocol Router portfolio consists of:

- Nortel Multiprotocol Router 2430
- Nortel Advanced Remote Node (ARN) Router
- Nortel Multiservice Access Switch 4400 series
- Nortel Multiprotocol Router 5430
- Nortel Access Stack Node (ASN) Router
- Nortel Backbone Node Router
 - Nortel Backbone Link Node
 - Nortel Backbone Concentrator Node
 - Nortel Backbone Concentrator Node Router

Nortel Multiprotocol Router 2430



Overview

The Nortel Multiprotocol 2430 is a high-performance, flexible, yet low-cost branch office solution. Its flexible WAN and LAN options, small size, and quiet operation make the Nortel Multiprotocol 2430 switch the ideal solution for any small branch office.

The Nortel Multiprotocol 2430 offers two WAN adapter module slots that provide an array of options for WAN requirements. The WAN modules support serial, ISDN BRI (S/T and U), V.34 modem and T1/FT1, E1/FE1 and 56 K CSU/DSU selections. An autosensing 10/100 Ethernet LAN gives Nortel Multiprotocol 2430 users flexibility and investment protection. Nortel BayRS software offers extensive WAN services support, allowing the most cost-effective primary and backup links for remote site applications. Nortel network management applications support comprehensive node configuration, monitoring, and control. The Nortel Multiprotocol 2430 meets the business needs for flexible connectivity, ease of use, and high performance for small branch environments at a cost-effective price.

Ideal For

Enterprise organizations that require multi-protocol branch access.

Business Challenges

- Do you want a solution to support your growing bandwidth requirements?
- Do you have limited network management expertise in your branch locations?

Typical Applications

- **High-performance, low-cost connectivity:** the Nortel Multiprotocol 2430 provides the same performance, scalability, and flexibility as large multiservice access devices at an industry-leading price.
- **Bandwidth management:** The Nortel Multiprotocol 2430 has software features that reduce costs through bandwidth management (compression and QoS) and simple remote management and monitoring (through Nortel network management).
- **High-speed LAN/WAN:** the Nortel Multiprotocol 2430 ensures high-speed WAN communications for remote sites that require full or multiple T1/E1 services. The Nortel Multiprotocol 2430 supports the industry-wide migration to fast, multiple-dedicated or dial WAN links. Autosensing 10/100 Ethernet allows small branch offices to upgrade their LANs as necessary.

Key Points

- **Value:** the Nortel Multiprotocol 2430 is a high-performance, flexible, yet low-cost office router. The sophisticated design, quiet operation, and range of mounting options allow use in any small office environment.
- **Performance:** the architecture of the Nortel Multiprotocol 2430 ensures concurrent execution of processor-intensive applications, with WAN bandwidth optimization, multiprotocol support, SNA network integration, and remote office link security.
- **Connectivity:** the Nortel Multiprotocol 2430 meets a wide variety of connectivity needs by supporting an autosensing 10/100 Ethernet and up to two WAN ports. A PCMCIA console modem provides out-of-band remote management and diagnostics.
- **Investment protection:** the Nortel Multiprotocol 2430 provides ample performance and network interfaces.
- **Low cost of ownership:** By extending LAN and WAN interface flexibility and performance, the Nortel Multiprotocol 2430 delivers the highest level of investment protection of any available enterprise-access platform.
- **Comprehensive LAN/WAN support:** the Nortel BayRS software supports all major LAN protocols. Nortel BayRS also supports the major bridging protocols and WAN options, as well as

the full range of dial services and SNA integration protocols.

- **Optimized bandwidth management:** optimized bandwidth using software compression, protocol prioritization, traffic filters, and bandwidth aggregation deliver increased network performance and throughput.
- **Best-in-class network management:** the Nortel network management application, with embedded RMON support for all network devices, provides complete management solutions for the smallest remote office to the largest network center.
- **Pay-as-you-grow:** the Nortel Multiprotocol 2430 provides users with an access-routing platform that supports the growth of a remote office. Start with a single-LAN-by-single-WAN system; add a V.34 modem for analog backup, then upgrade to digital backup via ISDN BRI.

Features and Benefits

- **High performance at a low price:** with a 50 MHz processor and standard 16 M DRAM, the Nortel Multiprotocol 2430 offers the features and performance of more expensive routers, but at a low price. The Nortel Multiprotocol 2430 is the perfect solution for small branch offices with demanding network and budgetary requirements. Additionally, the Nortel Multiprotocol 2430 quiet operation, sleek enclosure, and variety of mounting options allow its use virtually anywhere.
- **Simplified management:** the Nortel Multiprotocol 2430 simplifies configuration and management by using a variety of powerful tools, including EZ-Install, EZ-Update, and Nortel network management. This eases the burden for IT staff and allows for centralized management and monitoring. The Nortel Multiprotocol 2430 supports the use of a Xircom PCMCIA "Realport" 56 K V.90 modem for out-of-band remote management.

- **Flexible connectivity:** the Nortel Multiprotocol 2430 support for 10/100 LAN and a variety of WAN interfaces make it an ideal platform for remote sites with varied connectivity needs and LAN-based client/server traffic over frame relay, PPP, leased line, or dial-up links. Integrating transmission devices into the Nortel Multiprotocol 2430 chassis reduces the number of multivendor, separately managed devices and cabling.
- **Traffic management:** the comprehensive traffic management capabilities of the Nortel Multiprotocol 2430 use Nortel BayRS data compression, traffic prioritization, uniform traffic filters, and differentiated services queue management services (DSQMS).
- **Remote installation and management:** remote installation of the Nortel Multiprotocol Router 2430 is simplified through the use of EZ Install and EZ Update, two software applications designed to simplify installations, reconfigurations, and software updates from a central site.
- **HTTP-based monitoring:** the embedded Web server complements and extends the functionality of existing SNMP-based and command line interfaces (CLIs) such as site manager and the T1/BCC. The HTTP-based interface allows authorized Web browsers to access device management information for monitoring and troubleshooting.

Market Information

With a 50 MHz processor and standard 16 M DRAM, the Nortel Multiprotocol Router 2430 offers the features and performance of more expensive routers, but at a low price. The modular architecture of the 2430, along with the availability of a wide variety of easily upgraded WAN adapter modules, assure an easy, cost-effective migration path for upgrading to the newest WAN access technologies. This makes the 2430 the perfect solution for small branch offices with demanding network and budgetary requirements.

Technical Specifications

Architecture	• Base module using Motorola MC 860T microprocessor • One 10/100 Ethernet • Two WAN adapter modules per base module • One PCMCIA modem slot • One PCMCIA flash memory slot
Connectivity	• Ethernet (RJ-45) • 10/100 Base-TX (RJ-45) • Serial (44-pin: RS-449/422, RS-232, RS-530, V.24, V.35, X.21) • ISDN BRI S/T (RJ-45) • ISDN BRI U (RJ-45: integral NT1) • 56/64 Kb/s DSU/CSU (RJ-45) • T1/FT1 DSU/CSU adapter module (RJ-45) • E1/FE1 adapter module (RJ-45) • E1/FE1 adapter module (BNC) • V.34 modem (RJ-45) • PCMCIA 56 K V.90 modem
Packaging	• Tabletop, wall-mount, or rack-mount • Quiet, sleek enclosure • Kensington-compatible locking slot • AC voltage 100/240 V ac at 1.0 A maximum
Physical specifications	Height: 8.6 cm (3.4 in.) Width: 36.7 cm (14.4 in.) Depth: 20.3 cm (8.0 in.) Weight: 3.5 lb. (1.58 kg)
Environmental and regulatory	Altitude: 0 to 2400 m (0 to 8000 ft) Humidity: 10% to 95% (noncondensing) Temperature: 0° to 50°C (32° to 122° F) Safety: UL 1950, EN60 950, CSA 22.2 950, AS3260 RFI/EMI: FCC Part 15, Class A, CISPR 22A, VCCI Class A, AS3548 Class A

Ordering Information

For further information, contact your local Nortel representative.

Nortel Advanced Remote Node Router



Overview

Nortel Advanced Remote Node (ARN) Router delivers a comprehensive set of branch office functionality, enabling organizations to achieve significant competitive advantages. The modular design provides the capability to build highly flexible networks, delivers high performance throughput, and supports a wide range of field-upgradeable LAN and WAN options for data communication.

Ideal For

The ARN is ideal for small- to medium-sized remote sites that require multiprotocol LAN/WAN connectivity in support of LAN-based client/server or legacy SNA traffic.

Business Challenges

- Do you require Multiprotocol branch access routing with support for a wide range and number of interfaces?
- Do you need a solution that offers advanced IP multicast, VPN tunneling, and extensive Quality of Service capabilities?

Typical Applications

- **Legacy traffic transport:** The Nortel Advanced Remote Node (ARN) Router provides up to nine serial interfaces, enabling remote site users to pass SNA and X.25 traffic over the multiprotocol backbone via X.25 PAD, Nortel DLSw for SDLC, transparent synchronous pass-through, BSC pass-through, polled Async, and IPEX. These features reduce WAN costs by consolidating parallel links normally used to connect remote and corporate locations.
- **Dual LAN capability:** All Nortel ARN Router models are configurable, either at the factory or as a field upgrade, with a second LAN interface. In addition to providing mixed LAN media support (fast Ethernet, Ethernet and token ring); dual-LAN capability allows small sites to configure two "communities" as separate LANs, to provide network security using LAN firewall techniques.
- **High-speed WAN:** The high-performance design of the Nortel ARN Router ensure high-speed WAN communications for remote sites requiring full and multiple T1/E1 services. The aggregate forwarding rate of the Nortel ARN

Router easily supports the industry wide migration to faster, multiple dedicated or dial WAN links.

Key Points

- **Performance:** The Nortel ARN Router high-performance architecture ensures concurrent execution of processor-intensive applications, including SNA network integration (DLSw, APPN, SDLC), WAN bandwidth optimization (compression, prioritization, filters) and remote-office link security (filtering, encryption).
- **Integration:** Integrated WAN transmission device options include 56 K or T1/E1/ FT1/ FE1 DSU/CSUs, ISDN BRI with or without NT1 and V.34 modems.
- **Connectivity:** The Nortel ARN Router supports up to two LAN (fast Ethernet, Ethernet or token ring) and nine (WAN and/or legacy) interfaces.
- **Investment protection:** The future-proof design of the Nortel ARN Router provides ample performance and network interfaces for current and future application support.

Features and Benefits

- extended interface density and flexibility; optimized bandwidth
- supports high performance architecture (HPA)
- advanced quality of service (QoS) and routing capabilities

Nortel Advanced Remote Node Router is a branch access router that provides enhanced connectivity and forwarding capabilities for remote locations. A Motorola 33 MHZ 68040 microprocessor ensures high forwarding and filtering rates, scaling up to 25 000 packets per second (p/s) across each network interface. The

Nortel ARN Router provides high-speed WAN connectivity, high interface density, legacy traffic transport, dial services, dual LAN support, and available RMON hardware/software support.

The Nortel ARN Router delivers the performance and modularity to solve today's application needs and meets the increasing demands of the evolving corporate intranet. The design integrates the functions of multiple devices to reduce the complexity of remote network management. As a result, the Nortel ARN Router significantly lowers the total cost of ownership and provides the highest degree of investment protection for enterprise networks.

Nortel Advanced Remote Node Router delivers a comprehensive set of branch office functionality, enabling organizations to achieve significant competitive advantages. The modular design provides the capability to build highly flexible networks, delivers high performance throughput, and supports a wide range of field upgradeable LAN and WAN options for data communication.

Market Information

The Nortel ARN Router maximizes all aspects of an organization's internetwork investment. By extending LAN and WAN interface flexibility and performance, the Nortel ARN Router delivers the highest level of investment protection of any available enterprise access platform. With route forwarding throughput of up to 20 000 packets per second, the Nortel ARN Router can handle the most demanding remote branch applications with performance to spare. No other remote router can provide the range of integrated WAN devices, serial ports, and LAN interfaces as the modular ARN platform. Only the Nortel ARN Router provides users with an access routing platform designed to support the growth of your remote office.

Technical Specifications

Architecture	• Base module using Motorola MC68040 microprocessor • Two adapter modules per base module • One expansion module per base module • Two data collection modules: one per base module and one per expansion module
Connectivity	• Ethernet (15-pin AUI connector, RJ-45) • Token ring (9-pin AU connector) • 10/100 Base-TX (RJ-45) • 100 Base-FX (ST) • Serial (44-pin: RS-449/422, RS-232, RS-530, V.28, V.35, X.21) • ISDN BRI S/T (RJ-45) • ISDN BRI U (RJ-45: integral NT1) • 56/64-kb/s DSU/CSU (RJ-45) • T1/FT1 DSU/CSU adapter module (RJ-45) • E1/FE1 adapter module (RJ-45) • E1/FE1 adapter module (BNC) • V.34 modem (RJ-45)
Packaging	• Type: tabletop, wall-mount, or rack-mount - ac voltage 100/240 V ac at 1.0 A maximum - Wall receptacle NEMA 5-15R (100/240 V ac) (for use in North America) • dc voltage • Input voltage —48 to 60.7 V dc ($\pm 20\%$) • Input current 1.5 A maximum at —38 V dc • Height: 7.12 cm (2.80 in.) • Width: 43.84 cm (17.25 in.) • Depth: 31.77 cm (12.50 in.) • Weight: 6.80 kg (15 lb)
Environmental and regulatory	• Altitude 0 to 8000 ft (0 to 2400 m) • Humidity 10% to 90% (noncondensing) • Temperature: 0° to 50°C (32° to 122°F) • Safety UL 1950, TUV EN60 950, CSA 22.2 950 • RF/EMI FCC Part 15, VDE 0878, limit B, CISPR 22B

Ordering Information

For further information, contact your local Nortel representative.

Nortel Multiservice Access Switch 4400 Series



Overview

Nortel Multiservice Access Switch 4400 Series provides robust and flexible networking for all types of branch traffic. Voice, fax, video, LAN and other data services such as frame relay, SNA, SDLC, X.25, asynchronous, and HDLC are carried over a choice of link options to provide efficient, reliable and easily-managed services for mission-critical, time-sensitive applications.

Ideal For

The Nortel Multiservice Access Switch 4400 series delivers powerful, integrated multiservice networking for the enterprise. It is typically used as a central site solution for small to medium networks. The Nortel Multiservice Access Switch 4400 is also ideal for large enterprise or carrier networks, which provide high-performance branch access. Fully scalable, The Multiservice Access Switch 4400 is suitable for remote networks that comprise as few as two nodes to as many as several thousands when deployed with the Nortel Multiservice Switch 6400 or 7400 series.

- **Nortel Multiservice Access Switch 4430:** the lowest cost solution for branch office termination
- **Nortel Multiservice Access Switch 4450:** added termination capacity for large branch and small regional offices
- **Nortel Multiservice Access Switch 4455:** additional performance to address the needs of large regional and small central site requirements
- **Nortel Multiservice Access Switch 4460:** performance and voice termination capacity to address the central site requirements of small to medium networks

Business Challenges

- Do you want to reduce your STD and ISD telephone charges? The Nortel Multiservice Access Switch 4400 integrates voice and data networks to permit long-distance calls to be carried over the data backbone with full voice quality.
- Do you want to consolidate all of your legacy data services? The Nortel Multiservice Access Switch 4400 carries legacy X.25, asynchronous, SNA, and other proprietary host networks over a single network infrastructure.

Typical Applications

Nortel recognizes that deploying separate networks for voice, video, and data is challenging. Deploying separate networks leads to ineffective bandwidth use, application inflexibility, and added complexity. The solution is network consolidation over a single platform. Network consolidation provides cost savings, improves business communications, and increases efficiency. Nortel Multiservice Access Switch 4400 Series provides flexible networking for all types of branch office traffic over a single network infrastructure. Voice, fax, video, LAN, and other data services such as frame relay, SNA, SDLC, X.25, asynchronous and HDLC transmit over a choice of link options to provide efficient, reliable and easily managed services for mission-critical applications.

Key Points

The Nortel Multiservice Access Switch 4400 Series adds value to enterprise networks through key benefits such as:

- **bandwidth savings:** through dynamic bandwidth allocation, voice and data compression, silence suppression, fax demodulation and optimized LAN access protocols
- **branch office consolidation:** for branch offices including voice, fax, video, LAN, SNA, and data services across a single network link
- **scalability:** supports thousands of nodes when used with the Nortel Multiservice Switch 6400 Series of ATM enterprise network switches
- **low cost of operations:** based on switched virtual circuits to avoid a large number of provisioned connections
- **ClearVoice:** enables toll call savings while ensuring toll call quality
- **VoFR and VoIP:** provide voice integration choices

- **scalability and convergence:** enabling business growth and new applications
- **LAN interfaces:** including Ethernet 10 Base-T and Token Ring using legacy data module
- **WAN interfaces:** including IP, Frame Relay, ISDN, and leased lines
- **a range of connection speeds:** 56 K/64 K CSU/DSU, T1 CSU/DSU, E1 DSU, and ISDN TA
- **legacy data support:** including SNA over Ethernet and Async over TCP

Features and Benefits

- cost-effectiveness, scalability, and ease of provisioning and maintenance: using SVCs and SPVCs plus ongoing manageability simplified by integrated network management
- integrated end-to-end WAN solution from a single vendor:– Nortel Multiservice Switch 6400/7400 for high performance at large sites, Nortel Multiservice Access Switch 4400 optimized for small branch sites
- five classes of service integrated for end-to-end QoS
- priorities mapped to backbone ensure end-to-end quality and integrity
- prioritization for various IP applications
- key reliability and network assurance features
- low-cost dial-backup for all traffic, integrated redundant power, commit and auto-rollback for software and configuration backup and restore configurations; and proven cost-effective, mission-critical networks
- award-winning voice services: proven voice quality
- full 24 and 30 channels of the standard G.729 voice
- "Single-hop" call routing across the network

Technical Specifications

Chassis Features	Description
Form factor	Base card (Ethernet and serial port) 2 or 4 expansion slots 4460 5 slots 2 WAN, 2 Exp 1 PCMCIA Exp
Processor	4400 Motorola 68040 4455 Motorola 68060 4460 dual processors Motorola 860T and 860MH
Memory	16 MB Flash 16 MB DRAM
Power	ac /dc
Redundant power	Yes
Remote software download	Yes
Low-speed serial ports	30
High-speed serial ports	17
VoIP	Yes
VoATM	4430, 4450, and 4455: No 4460: Yes
Analog support (maximum number of ports)	8
FXS, FXO, E and M	8 ports configurable 4460 (FXS and E and M only)
Digital support	Yes

Digital (maximum number of channels)	4430, 4450, and 4455: 30 4460: 60
Compression type	4430, 4450, and 4455: G729 4460: G729 A and B, G711
Signaling support	CAS, QSIG
Echo cancellation	4430, 4450, and 4455: 16 ms (G165) 4460: 16 ms (G165 and G168)
Silence suppression	Yes
Fax support	24/30 channels: 2 analog or BRI 4460: 60 channels
Fax demodulation	Yes
LAN protocols number of ports	4430, 4450, and 4455: 1 4460: 2
Ethernet	4430, 4450, and 4455: 10 BaseT 4460: 2-port 10/100 BaseT
Token ring	Yes
Traffic protocols supported	IP, IPX, Appletalk through bridging
Routing protocols supported	Rip1, Rip2, OSPF
RFC1490	Yes
Trunking options	
Frame relay	Yes
ISDN	Yes
CSU/DSU	T1/E1, 56 000
Leased line	Yes
Interface	RS-232, X.21, V.35, V.36
Number of PVCs	24 per parent node
Number of SVCs	255 SVC DLCIs per PVC
Interworking with WAN switch	Yes
FR/ATM interworking	Yes
Network management	SNMP Nortel Ethernet Switching Element Manager
End-to-end network management	Yes
QoS	End-to-end
Prioritization	4 classes, weighted fair queuing, IP prioritization
RSVP support for IP	No
Configuration	Embedded Web server, command line

Ordering Information

For further information, contact your local Nortel representative.

Nortel Multiprotocol Router 5430



Overview

Nortel Multiprotocol Router 5430 provides high-performance routing capabilities for large, bandwidth-intensive remote offices that have outgrown traditional branch office routers. With the ability to support concurrent, compute-intensive applications such as IP quality of service (QoS), IP multicast and compression, the Nortel Multiprotocol Router 5430 satisfies growing requirements for high-traffic, mission-critical applications. The Multiprotocol Router also reduces WAN operating costs by incorporating features to integrate voice, video, and data across a choice of WAN services.

Ideal For

- organizations whose applications demand high bandwidth at remote sites
 - ATM on the WAN
 - financial industry
- vertical-specific applications pushing large amounts of data
 - dramatic increase in traffic
 - need more advanced traffic management (DiffServ, WFQ, WRED)
 - need business-critical traffic prioritized over non-critical traffic
 - use new latency-sensitive applications like VoIP
 - want policy-based services across network infrastructure

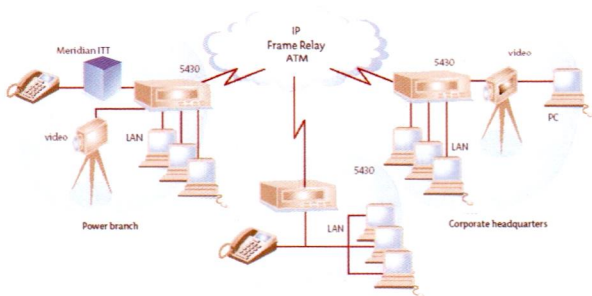
Business Challenges

- Do you want to integrate voice, video, and data applications across a common WAN circuit to reduce the recurring costs of WAN transmission services?
- Do you have heavy performance loads at your remote sites?

Typical Applications

- Multiprotocol branch access routing where a large range or number of interfaces is required
- core router for small to medium enterprises
- a high-performance branch switch enabling wire speed LAN-to-LAN routing and high-speed connectivity back to the central site
- WAN modules that can be used as uplinks from other remote sites that use the Nortel Multiprotocol Router 5430, to provide more efficient use of the high-speed links to the central site

Network Diagram



Key Points

- **robust routing with scalability, performance, and QoS**
- **supports multiple WAN technologies including ATM T1/E1 and T3/E3, frame relay, PPP, and ISDN to minimize bandwidth and connectivity costs and provide room to grow**
- **voice and data convergence**
- **flexible design**
 - modular configuration to match site requirements today and tomorrow
 - configurable interfaces for changing applications
- **serviceability/manageability**
 - Nortel Enterprise Network Management System, directory, and policy services
 - all active components serviceable without removing chassis
- **control of life cycle costs**
 - excellent price and performance
 - investment protection
 - exploit changing WAN service tariffs (ATM, PPP, FR, VPN)
 - common and simplified operations reduce impact and costs

Features and Benefits

- **High performance platform:** This router handles heavy performance loads at remote sites. Its high-performance architecture supports concurrent execution of processor-intensive applications including WAN bandwidth optimization, SNA network integration, advanced peer-to-peer networking, and remote office link security.
- **Reduced cost through multiservice integration:** It integrates voice, video, and data applications across a common WAN circuit to reduce the recurring costs of WAN transmission services. Transport options include ATM T1/E1 and T3/E3, frame relay, PPP, T1/E1, ISDN, and ATM circuit emulation services.
- **Simplifies maintenance and serviceability:** The Nortel Multiprotocol Router 5430, with its Advanced Remote Node WAN and PMC I/O modules, is simple to install and service, without opening the chassis.

- **Maximizes investment protection:** The modular architecture of the Nortel Multiprotocol Router 5430 meets the changing requirements of the remote office network.
- **Next-generation architecture:** the most current silicon in a unique architecture, Nortel Multiprotocol Router 5430 is as a flexible and high-performance solution to address "power branch" requirements.
- **Advanced IP and multi-protocol routing**
- **IP QoS services:**
 - Differentiated services (DiffServ)
 - weighted fair queuing (WFQ), random early detection (RED), and weighted random early detection (WRED)
 - RSVP

Market Information

The Nortel Multiprotocol Router 5430 combines several technologies in a unique, multiservice WAN solution for power branch offices. These technologies, typically found individually in other products, build on industry-wide acceptance and high-volume production to quickly deliver features to market at the best price for the application. At the core of the architecture is the telecom-qualified Compact PCI (cPCI) backplane, which provides a standard interface for interconnecting slots using packet, cell, or Time Division Multiplexing (TDM) technologies. Standard mechanical components assure a rugged and reliable product. The use of industry-qualified PCI, H.110 and Utopia bus interfaces drives down the price for this implementation. The PCI Mezzanine Card (PMC) further reduces the price of physical interface options, while delivering the configuration flexibility appropriate to a branch office application. With its high level of integration and high internal bandwidth, the Motorola Power QUICCII processor achieves optimal performance across several high-speed interfaces. The Passport 5430 brings these price-performance benefits to the market in a flexible package. The mix of technologies can evolve to meet the expanding network requirements of the branch office.

Technical Specifications

Specification	Description
Architecture	Base Chassis • Redundant power supply—Universal AC • Main processor board with dual flash memory, 1 PMC slot, dual 10/100 Ethernet • Three expansion modules per base module: 2 PMC slots per slot, 7 per system • Three ARN WAN modules • One V.34 ARN WAN console
Connectivity	10/100 Base-TX: RJ-45 Adapter Modules • Serial Adapter Module: 44-pin: RS-449/422, RS-232, RS-530, V.28, V.35, X.21 • ISDN BRI S/T Adapter Module: RJ-45 • ISDN BRI U Adapter Module: RJ-45 integral NT-1 • 56/64 Kb/s DSU/CSU Adapter Module: RJ-48-C • T1/FT1 DSU/CSU: RJ-48-C • E1/FE1: RJ-45 or BNC • V.34 Modem: RJ-45 PCI Mezzanine Cards • ATM T1/E1: RJ-48 • ATM T3/E3: mini-SMB • Dual Sync: 68-pin (2-port breakout cable)—X.21, V.35, RS-232, EIA 449, EIA-530 • Quad Serial : 120-pin (4-port breakout cable)—X.21, V.35, RS-232, EIA-449, EIA-530
Electrical specifications	90 to 264 V AC
Operating Environment	Temperature: 10° to 35°C (50° to 95°F) - Relative humidity 10% to 90% noncondensing
Bandwidth management	Compression • Protocol prioritization • COPS - DS • IntServ/RSVP • DiffServ Random Early Detection (RED) • Weighted Random Early Detection (WRED) Weighted Fair Queuing Code Point Marking
Redundancy features	Power supply • Virtual router redundancy protocol • Dial backup • Alternative path • Dual flash cards • Redundant interface
ATM	UNI 3.0/3.1/4.0 • UBR for data: AAL5 • CBR for Circuit Emulation Service: AAL1 • RFC 1577, 1483, 1490, and null encapsulation

Ordering Information

For further information, contact your local Nortel representative.

Nortel Access Stack Node Router

Overview

The Nortel Access Stack Node (ASN) Router is a stackable router architecture that provides cost-effective solutions for enterprise network centers. The Nortel ASN Router provides seamless integration of multiple ASN units stacked and managed as a single router. Adding interfaces beyond unit capacity does not require replacing routers or adding complexity to the network.



An ASN stack supports up to 200 000 packets per second with up to 48 network interfaces. The Nortel ASN router supports all major network and bridging protocols, wide area services and IBM standards. The fault-resilient system software ensures high network availability. The LAN and WAN interfaces meet connectivity needs for remote and campus offices and its data compression coprocessor provides compression over all WAN interfaces, reducing the number of circuits required to meet network bandwidth needs. The ASN satisfies connectivity, performance, and availability requirements ranging from workgroup or remote site access to high-performance, highly available network centers.

Ideal For

- Enterprise network centers.
- Small to medium enterprises as a single node.
- Large enterprises as a stacked node.

Business Challenges

- Do you want a flexible, growth-oriented solution to meet the connectivity needs of your main and remote office locations?
- Is network availability and reliability important to your business?

Typical Applications

- multiprotocol branch access routing where a large range or number of interfaces is required
- core router for small to medium enterprises as a single node, for large enterprises as a stacked node
- remote offices
- large offices consisting of several LANs, SNA/SDLC devices, or high-speed LANs
- network centers with application servers and services supporting an extended enterprise network

Key Points

- ensures network availability
- enhances network performance
- extends network connectivity
- simplifies network administration
- provides low cost of ownership
- scalable

Features and Benefits

- **Helps to ensure network availability:** the ASN operates the Nortel suite of extensive, proven multiprotocol and IP services. The ASN maintains high availability through hardware and software fault isolation and recovery, and online dynamic reconfiguration. The ASN's hot-swap capability supports the replacement of individual ASN units within a stack. ASN stack configurations also support the use of multiple PCMCIA flash memory cards for redundant nonvolatile storage of system software. Flash partitioning provides file system redundancy for single ASN configurations.
- **Hardware-based data compression coprocessor net module:** the data compression coprocessor network module offloads compression and decompression tasks from the main CPU. This module supports ISDN, PPP, and frame relay links and is interoperable with hardware and software compression operating in other Nortel routers.
- **Stack packet exchange hot-swap (SPEX-HS):** the SPEX-HS net module and cable combine to interconnect ASN base units into a single router and you can remove or add any individual unit in an ASN stack, without affecting the operation of the remaining units in the stack. The cable has four connectors or interconnecting two to four ASN units. Using an

extra cable provides redundancy and higher bandwidth. The SPEX-HS net module operates the interconnect bus at 256 Mb/s. When two SPEX-HS cables are used, the effective speed of the SPEX-HS is 512 Mb/s.

- **Flexible network environments:** the ASN uses a highly scalable architecture, which provides cost-effective, growth-oriented solutions for enterprise network centers.
- **High-performance processor:** the ASN processor module maintains high filtering and forwarding rates. The ASN 8, 16, or 32 MB of DRAM is configurable to support buffers that prevent traffic overflow and network delays. The ASN optional 256 KB fast-packet cache increases forwarding performance. The ASN supports a standard PC type 2 flash memory card for nonvolatile storage of the ASN system software, configuration file, and event log. You can locally divide the flash into two partitions of equal size, or you can use additional PC cards to store backup copies of the software image and configuration file. The ASN processor module has four interface module (net module) positions for cost-effective network connectivity.
- **LAN and serial interfaces:** the ASN provides network connectivity through a selection of net modules. Redundant LAN interfaces and router features, along with redundant power supplies, ensure continued network operation.
- **Enhances network performance:** the ASN provides high-system performance up to 50 000 pps per ASN unit. A four-unit ASN stack supports forwarding performance up to 200 000 p/s, with 512 Mb per second (Mb/s) of bandwidth using dual network modules between ASNs. User-configurable DRAM and fast packet cache options optimize system memory requirements.
- **Extends network connectivity:** the ASN provides a cost-effective, entry-level solution for network centers. The ASN's unique "stackable" architecture supports up to 4 ASNs (with up to 12 network interfaces per unit) that can interconnect many networks.
- **Simplifies network administration:** an ASN stack of any size is managed as a single device in the network. As the ASN stack expands, the workload of network operations staff does not increase to support the router. The ASN requires only one software image and configuration file.
- **Provides low cost of ownership:** the ASN reduces equipment costs with features such as high port densities and integrated MCT1, CSUs/DSUs. The ASN also supports large numbers of virtual circuits in a single node. Data compression further reduces the number of required circuits. Multiple individual routers can interconnect to create a single multiprocessor router. This inherent scalability addresses future needs.

Technical Specifications

Specification	Description
Architecture	• Processor module based on Motorola 68040 microprocessor • Four net modules per processor module • Four-unit stack configuration using SPEX-HS • Symmetric, multiprocessor architecture with multiple units • 256 Mb/s, processor interconnect with SPEX-HS • 512 Mb/s, processor interconnect with two SPEX-HS • 32 context, hardware compression coprocessor net module • 128 context, hardware compression coprocessor net module
Connectivity	• Ethernet interface (15-pin AUI connector or 8-pin modular) • Token ring interface (9-pin MAU connector) • FDDI (two MIC, one RJ-11 optical bypass) • Synchronous interface (44- and 50-pin connector to RS-422, RS-232, V.35, X.21 adapter cable) • ISDN BRI and ISDN PRI • 100 Base-T interface (40-pin MII connector or 8-pin modular) • MCT1 (RJ-48C, 15-pin, DB connector) • MCE1 (BNC, 75 ohm, 8-pin modular, 120 ohm)
Packaging redundant	Tabletop/rack-mount
Dimensions	Height: 10.99 cm (4.33 in.) Width: 44.45 cm (17.50 in.) Depth: 43.18 cm (7.00 in.)
Weight	12.30 kg (27 lb)
AC voltage	100 to 240 V ac at 4.0 A max (50 to 60 Hz)
Wall receptacle	NEMA 5-15R (100 to 240 V ac, for use in North America)
DC voltage requirements	Input voltage: 48 V dc Input current: 8.5 A maximum Inrush current: 60 A maximum
Altitude	0 to 2400 m (0 to 8000 ft)
Humidity	20% to 80% (noncondensing)
Temperature	0°C to 40°C (32°F to 104°F)
Safety	UL 1950, TUV EN60 950, CSA C22.2 #950
RFI/EMI	FCC Part 15 Class A, EN55022 Class A

Ordering Information

For further information, contact your local Nortel representative.

Nortel Backbone Node Router



Overview

The Nortel industrial strength Nortel Backbone Node Router consists of the Backbone Link Node (BLN) and Backbone Concentrator Node (BCN), which multiprotocol routers that satisfy the high performance and availability requirements of the most demanding mission-critical backbone internetworks.

The Nortel Backbone Node Router family delivers enhanced network performance and availability, multivendor interoperability, and investment protection. Nortel Backbone Routers feature a symmetric multiprocessor architecture that uses multiple MC68040 – or MC68060-based fast routing engine (FRE) processors, multiple dual PowerPC microprocessor-based ATM routing engine (ARE) processor modules and a 1 Gb/s parallel packet express (PPX) to deliver industry-leading performance and availability. Configured with Nortel Routing Services software, the Nortel Backbone Node Routers provide multiprotocol routing and bridging to maximize connectivity and interoperability in multivendor, multiprotocol environments. Comprehensive hardware and software redundancy

features provide complete fault resiliency, while dynamic reconfiguration and hot-swap features allow online changes in hardware and software configurations.

Ideal For

- Medium to large enterprises with mission-critical backbone networks.
- Medium to large network centers or large regional offices.
- Multivendor, multiprotocol environments.

Business Challenges

Large networks require a high-performance, scalable routing device that can deliver all types of data quickly and efficiently, over any network topology, with no interruptions in service.

Routers in these distributed environments must also provide all the necessary wide area network (WAN) interfaces, while delivering the highest possible throughput across expensive WAN bandwidth. Investments in features like multicasting and quality of service (QoS) mean that organizations need their router to perform at optimal levels well into the future.

Typical Applications

Combining comprehensive local, wide area, and ATM connectivity with high performance and availability, the Nortel Backbone Node Routers satisfy all the requirements for data center

routing applications. Nortel Backbone Node Routers complement the Nortel Access Stack Node (ASN) Router, Nortel Advanced Remote Node (ARN) Router, and Nortel Ethernet Routing Switches 2430 and 5430 to satisfy all connectivity, performance, and availability requirements ranging from cost-effective workgroup or remote-site access to high-performance, highly available network centers.

The Nortel Backbone Node Router meets the needs of large network centers; it provides full redundancy for continuous network availability, 13 slots support up to 104 WAN interfaces, and performance that scales to 5 million pps. The Nortel Backbone Node Router redundant line cord (RLC) configuration allows sites to connect two power sources to the Nortel Backbone Node Router for enhanced system redundancy, additional resiliency, and high availability.

The Nortel Backbone Node Router meets the needs of medium network centers or large regional offices. It is available with or without redundant power supplies. Four slots support up to 32 physical network interfaces and performance scales to 1.5 Mp/s.

Key Points

- Enhances network performance: Nortel

Backbone Node Routers deliver the performance required for the most demanding internetworks using fast Ethernet, Gigabit Ethernet, FDDI, ATM, and SNA backbones. With symmetric multiprocessor architecture, based on multiple routing engines and the 1 Gb/s parallel packet express (PPX) processor, Nortel Backbone Node Routers deliver the highest performance in the industry—up to 5 million pps of aggregate forwarding. The ATM routing engine provides exceptionally high-performance virtual network routing in ATM-based switched internetworking architectures, supporting up to 2000 simultaneously active virtual circuits and wire-speed routing between virtual LANs.

- **Increases network availability:** Nortel Backbone Node Routers set the standard for network availability required for mission-critical applications in multiprotocol environments. High availability is made possible by the high-performance SMP architecture, along with hardware redundancy options, fully distributed system software, and comprehensive fault management capabilities. Dynamic reconfiguration and nondisruptive operational servicing (hot-swap) allow online changes in hardware and software configuration. Support for redundant ac line cords, power supplies, network interfaces, and routers seamlessly yield the highest levels of network availability.
- **Protects network investments:** the Nortel Backbone Node Routers underscore the Nortel commitment to delivering enterprise-scale, standards-based products. For example, the same link modules are used in the 4-slot BLN and in the 13-slot BCN routers. This high level of interoperability and compatibility protects investments in both products and maximizes the valuable expertise of highly trained IT staff.

Features and Benefits

Both members of the Nortel Backbone Node Router family scale to meet the throughput and connectivity requirements of the largest networks. Providing aggregate system-forwarding performance that scales to 5 million pps, the Nortel Backbone Node Router supports up to 104 WAN interfaces, 52 local area network (LAN) interfaces, and 13 ATM or fiber distributed data interfaces (FDDI). The Nortel Backbone Node Router

supports forwarding speeds of over 330 000 pps, using up to 32 WAN interfaces, 16 LAN interfaces, and 4 ATM or FDDI interfaces.

Both routers feature comprehensive hardware and software redundancy options for the utmost in fault resiliency under all conditions. Using Nortel routing services multiprotocol routing services, the Nortel Backbone Node Router facilitates interoperability in multivendor environments with support for major network and bridging protocols and wide area services.

LAN connectivity includes Ethernet/802.3, 4 and 16 Mb/s token ring/802.5, FDDI, and 100/1000 Base-T. Wide-area connections are provided through synchronous lines operating from 1200 b/s to 52 Mb/s, including fractional T1, T1/E1, HSSI, and DS0A support. ATM networks can operate at up to 155 Mb/s when connected using a SONET/SDH STS-3/STM-1 interface.

- **Industry-leading performance and scalability:** innovative software architecture increases performance and provides complete fault resiliency by distributing network tasks among multiple processor modules, while confining computer memory-intensive tasks to a single processor module. High port density for the largest networks to combine with unmatched performance.
- **Optimizing WAN bandwidth:** industry-leading hardware and software compression delivers a scalable solution for deployment across any Nortel Backbone Node WAN link interface. Nortel hardware compression can compress up to 60 Mb/s of data, freeing processing cycles to perform advanced functions like priority queuing and traffic filtering.
- **Unparalleled interoperability:** committed to standards-based products, the Nortel Backbone Node Routers are fully interoperable across Nortel product lines to provide compatibility and investment protection.
- **Unsurpassed scalability:** the symmetric multiprocessor of the Nortel Backbone Node Router incrementally adds processing power with each link interface. Supporting up to 5 million pps of aggregate forwarding and offering high-performance connectivity for up to 104 WAN interfaces per router, including up to 52 T1

interfaces, the Nortel Backbone Node Router family meets the demands of the most mission-critical applications in any network center.

- **Comprehensive LAN/WAN support:** Nortel Routing Services supports all major LAN protocols (IP, IPX, AppleTalk, DECnet, OSI, VINES, ST-II, and XNS), all major WAN options (frame relay, ATM, ISDN PRI, X.25, HDLC, PPP multilink, SMDS, and SDLC), dial backup, bandwidth-on-demand, and dial-on-demand, as well as bridging and IBM DLSw, APPN (with HPR) and synchronous pass-through to enable the Nortel Backbone Node Router to adapt to almost any network environment.
- **Superior network management:** the Nortel family of network management tools provides comprehensive router management solutions for various platforms. Device management support is included in the Nortel command console (NCC) and embedded Web server to perform configuration, troubleshooting and monitoring.
- **Optimizes network performance:** Nortel symmetric multiprocessor architecture delivers the highest performance in the industry—up to 5 million pps forwarding

throughput.

- **Reduced WAN costs:** WAN optimization features such as hardware- and software-based data compression, priority queuing, uniform traffic filters, and bandwidth aggregation significantly reduce WAN costs.
- **Delivers enhanced IP services:** Nortel is an industry leader with advanced IP services such as progressive traffic management, policy management, and internetworking services to deliver highly optimized IP networks. Nortel routing services provide advanced security through IPSec interoperability with Nortel VPN, bi directional NAT support, IPSec/NAT forwarding filters, and RADIUS enhancements for SecureID.
- **Proven Layer 3 solutions:** fully integrated virtual LAN (VLAN) support with Nortel Ethernet Switches and Nortel Ethernet Routing Switch 8600 Layer 2 and 3 switches deliver multiprotocol migration and WAN remote office concentration. In addition, Nortel provides differentiated services (DiffServ) and virtual router redundancy protocol (VRRP) support.

Technical Specifications

	BLN	BLN 2	BCN	BCN RLC
Physical dimensions	Height: 22.1 cm (8.7 in.) Width: 48 cm (19.0 in.) Depth: 50 cm (19.7 in.)	Height: 35.6 cm (14.0 in.) Width: 43.9 cm (17.3 in.) Depth: 58.2 cm (22.9 in.)	Height: 62.0 cm (24.4 in.) Width: 48.3 cm (19.0 in.) Depth: 50.0 cm (19.7 in.)	Height: 62.0 cm (24.4 in.) Width: 48.3 cm (19.0 in.) Depth: 50.0 cm (19.7 in.)
Mount type	tabletop and rack-mount	tabletop and rack-mount	rack-mount	rack-mount
Weight	29.5 kg (65 lb)	56.7 kg (125 lb)	95.25 kg (210 lb)	95.25 kg (210 lb)
Power supplies	1 ac	1-2 ac or dc 1-4	ac or dc	4 ac
Base unit options	BLN Base Unit: Includes a 4-slot BLN chassis with one SRM-L, one flash memory card, an integral 620-watt power supply, and documentation. Nortel Multiprotocol Router software suite.	BLN-2 Redundant Base Unit: Includes 4-slot BLN-2 chassis with one SRM-L, one flash memory card, two 620 Watt power supplies, and documentation. Nortel Multiprotocol Router software suite. BLN-2 Redundant dc Base Unit: Includes a 4-slot BLN-2 chassis with one SRM-L, one flash memory card, two -48 V dc power supplies, and documentation. Nortel Multiprotocol Router software suite. BLN-2 Nonredundant Base Unit: Includes a 4-slot BLN-2 chassis with one SRM-L, one flash EPROM card, a 620-W power supply, and documentation. Nortel Multiprotocol Router System software suite	BCN Base Unit: Includes a 13-slot BCN chassis with one SRM-L, one Flash memory card, one 620-watt power supply, and documentation. System software includes the Nortel Multiprotocol Router software suite. BCN dc Base Unit: Includes a 13-slot BCN chassis with one SRM-L, one flash memory card, a -48 V dc power supply, and documentation. System software includes the Nortel Multiprotocol Router software suite.	BCN RLC ac Base Unit: Includes a 13-slot BCN chassis with a SRM-L, SRM-F, and four 620-watt power supplies. BCN RLC ac Spare Chassis: Includes a 13-slot BCN chassis. Power supplies and SRMs must be ordered separately
System hardware redundancy options	Redundant System Resource Module (SRM-F) Additional ac or dc power supply 16M Flash Card spare-formatted			

Connectivity				
LAN Interfaces (Max)	• Gigabit - 4 • (4) 10/100 BaseT - 16 • 100 Base-T - 8 • Ethernet - 16 • Token Ring - 16 • FDDI - 4 • ATM - 4	• Gigabit - 4 • (4) 10/100 BaseT - 16 • 100 Base-T - 8 • Ethernet - 16 • Token Ring - 16 • FDDI - 4 • ATM - 4	• Gigabit - 13 • (4) 10/100BaseT - 52 • 100 Base-T - 26 • Ethernet - 52 • Token Ring - 52 • FDDI - 13 • ATM - 13	• Gigabit - 13 • (4) 10/100 TBaseT - 52 • 100 Base-T - 24 • Ethernet - 52 • Token Ring - 52 • FDDI - 12 • ATM - 10
Serial interfaces (maximum)	• Synch (RS-449, RS-422, RS-232, V.35, X.21 - 32 • Synch with Compression Coprocessor - 32 • HSSI - 4	• Synch (RS-449, RS-422, RS-232, V.35, X.21 - 32 • Synch with Compression Coprocessor - 32 • HSSI - 4	• Synch (RS-449, RS-422, RS-232, V.35, X.21 - 104 • Synch with Compression Coprocessor - 104 • HSSI - 13	• Synch (RS-449, RS-422, RS-232, V.35, X.21 - 104 • Synch with Compression Coprocessor - 96 • HSSI - 11
ISDN PRI/Multichannel T1	• Dual - 8 • Quad - 15		• Dual - 26 • Quad - 52	• Dual - 24 • Quad - 52
ISDN PRI/Multichannel	8	8	26	24
Power requirements	BLN ac: ac Voltage 100 to 120 V ac at 10 A min. 200 to 240 V ac at 5 A min. NEMA 5-15R (110 to 120 V ac) NEMA 6-15R BLN: 48 V dc Power Supply Requirements Input voltage: -41 to -58 V dc Input current: 63 A maximum Inrush current: 80 A peak maximum	BLN-2: 1 to 2 acC or dc 1 to 4; acC Voltage 100 to 120 V ac at 12 A min. 200 to 240 V ac at 6 A min. 2 NEMA 5-15R (110 to 120 V ac) 2 NEMA 6-15R (200 to 240 V ac) BLN-2: 48 V dc Power Supply Requirements Input voltage: -41 to -58 V dc Input current: 63 A maximum Inrush current: 80 A peak maximum	BCN: ac voltage 200 to 240 V ac at 13A 100 to 120 V ac at 16A NEMA L6-20R (USA) IEC 309 16A (Europe) NEMA L5-20R (USA)	BCN RLC: ac voltage ac wall receptacle required NEMA L6-20R (USA) IEC 309 16A (Europe) (200 to 240 V ac)
Environmental and regulatory specifications	Altitude: 0 to 2400 m (0 to 8000 ft) Humidity: 10% to 90% (noncondensing) Temperature: 0° to 40°C (32° to 104°F) Safety: UL 1950, TUV EN60 950, CSA 22.2 950 RFI/EMI: FCC Part 15-J Class A, VDE 0871/0878			

Ordering Information

For further information, contact your local Nortel representative.

Nortel IP Services Routing Portfolio

Nortel IP Services Routing portfolio offers unique benefits for enterprises, service providers, and government organizations that need a scalable, resilient, secure solution to deploy a multitude of applications. The Nortel IP Services Routing portfolio is the only true convergence platform available today for large enterprises and data service providers. Any large organization can benefit from universal aggregation to deploy broadband services, easy deployment into large network-based IP VPNs, a suite of IP security services to protect the network and its users, and other important features.

- Nortel Services Edge Router 5500

Nortel Services Edge Router 5500



Overview

The Nortel Services Edge Router 5500 is an industry-leading IP services switch that combines both network transport services and high-touch IP services in a single platform. The Nortel Services Edge Router 5500 is the only true convergence platform available to large enterprises and data service providers today.

For the enterprise, the Nortel Services Edge Router 5500 delivers industry-leading high-touch IP processing power for large mission-critical networks. This router simplifies network operation and reduces equipment costs while offering a host of important network based services, such as VPNs, traffic management and policing, quality of service (QoS), and firewall and security services—all within a single device.

For service providers, the Nortel Services Edge Router 5500 brings IP services to broadband data access, just as the Nortel DMS-100 brought advanced call services to voice. Located at the network edge, the Nortel Services Edge Router 5500 delivers scalable and reliable subscriber aggregation regardless of the access and transport technologies and protocols used in the customer network. The Nortel Services Edge Router 5500 then uses the power of more than 100 processors to provide advanced IP services to these subscribers. These network-based IP services include a dedicated firewall for each subscriber, secure IP VPNs (supporting intranet, extranet, and remote access), advanced quality of service, network address translation (NAT), and personalized content delivery services.

Ideal For

- Large enterprises especially in the finance, utilities, and hospitality industries that require a scalable, resilient, and redundant solution to aggregate thousands of remote users and provide scalable IP VPN services
- Large enterprises that want to deploy a range of advanced IP and security services such as FW, intrusion detection, and NAT without deploying and managing a multitude of discrete appliances
- Government organizations and government departments that need security and large-scale user management
- Service providers that offer broadband services, access wholesale services, managed network-based IP-VPN solutions, and managed IP security services

Business Challenges

Enterprises:

- Do you manage a large IP network with hundreds or thousands of users?

- How many discrete devices and applications do you need to manage to provide services such as Internet access, IP security, remote access, QoS, and IP-VPN? Do you want to consolidate and reduce the number of hardware platforms?
- Do you need to provide secure intranet, extranet, and remote access for your customers, suppliers and for your mobile workforce? Do you want to consolidate your IP services into an easy-to-manage, secure, and centralized VPN solution?
- How much does your carrier infrastructure cost? Do you want to make your network independent of the underlying access technology and take advantage of services like xDSL and cable modem access?
- How much of your time is spent on moves, adds, and changes in your network? Do you want to provide self-management capabilities to the employees in your company, your customers, and your suppliers?

- How much do you know about the real-time performance of your network? Do you want to see up-to-the-minute statistics on the performance of all your VPNs and other network services in a centralized fashion?

Service providers:

- Do you need to provide broadband aggregation services on xDSL, cable or wireless networks scaling to thousands of users?
- Who is your target market for managed IP services? Would you like to expand it?
- Do you offer CPE-based IP services? What is your up-front investment per customer? What is your cost per truck-roll? What profit margin do you receive from selling IP services?
- If you sell access and broadband aggregation only, what is your customer turnover rate? What differentiates you from the competition?

Typical Applications

Enterprises deploying the Nortel Services Edge Router 5500 in their network enable centralization and rapid deployment of applications such as:

- **VPNs (VR- and MPLS-based):** technology and access agnostic VPNs, with site-to-site, remote access, extranet access and firewall-enabled local Internet access options
- **Visitor-based networks:** flexible, secure, and billable access for guests of the hospitality industry
- **Network-based security:** with firewall, encryption, denial of service (DoS) protection, anti-spoofing, and NAT
- **Differentiated services:** for special treatment of different organizations, departments, and users and enforcement of QoS for applications such as VoIP
- **Remote office aggregation:** with universal support of user technologies and centralized management from the Nortel Services Edge Router 5500, service providers deploying the Nortel Services Edge Router 5500 in the network provide of large-scale managed applications for the residential, SoHo, SME, and corporate market
- **Universal broadband aggregation:** unique broadband aggregation and subscriber management services specifically for the DSL,

dial-up, cable access, and wireless access markets

- **Advanced wholesaling of access networks and IP services:** for access providers, expanded business models through a number of advanced wholesaling features
- **Advanced high-touch IP services:** a rich set of value-added high-touch IP services (security, CoS/QoS and traffic steering, and custom content delivery) enabling service providers to grow their top line services revenue
- **Subscriber self-management and on-line reporting capabilities**

Key Points

- In the enterprise, the Nortel Services Edge Router 5500 delivers industry-leading, high-touch IP processing power for large mission-critical enterprise networks. The Nortel Services Edge Router 5500 simplifies network operation and reduces equipment costs for the enterprise while offering a host of important network-based services, such as virtual private networks (VPNs), traffic management and policing, quality of service (QoS), and firewall and security services from a single device. The universal access capabilities enable rationalization of network connections in the enterprise network operations center (NOC), while the robust processing power enables granular policy enforcement to the end-user level. The Nortel Services Edge Router 5500 is equipped with a rich set of network-based security features such as firewall, denial of service (DoS) protection, and network address translation (NAT). The Nortel Services Edge Router 5500 also enables flexible network-based IP-VPN options with support for both virtual router/IPSec and MPLS tunneling options.

Support exists for traffic management, tiered services, and content management on the Nortel Services Edge Router 5500 platform to enable the high degree of control required by demanding enterprise applications such as VoIP. The Nortel Services Edge Router 5500 enables centralized network management of all

these services for operational simplicity for enterprise sites. With the network-based Nortel Services Edge Router 5500 as the primary service mediation and delivery engine, network managers can control these services from a single device instead of multiple devices that are not centrally located.

- In the service provider infrastructure, the Nortel Services Edge Router 5500 is the undisputed leader in IP service platforms since inception in 1999. The Nortel Services Edge Router 5500 delivers scalable, reliable, and cost-effective advanced IP services and subscriber aggregation regardless of the network access and transport protocols and technologies. Capabilities of the Nortel Services Edge Router 5500 extend to virtual firewalls, IP-VPNs (intranet, extranet, remote access, and MPLS based), advanced QoS and CoS, NAT policy-based routing, and personalized content delivery.

Features and Benefits

- **Universal aggregation:** The Nortel Services Edge Router 5500 aggregation solution is unique in supporting a broad spectrum of subscriber types and access technologies. The rich feature set and powerful hardware platform can lower the costs of providing broadband aggregation and subscriber management services specifically when selling the Nortel Services Edge Router 5500 into DSL, dial-up, cable, and wireless service provider markets.

Subscriber types that can terminate over the SER include PPPoE, PPPoA, IP over ATM, IP over frame relay, HDLC/PPP over frame relay, L2TP, IPSec, GRE, VLAN tagged, and IP-Demux. The SER uniquely identifies each terminated subscriber and applies the predetermined IP service policies according to subscriber profile. Universal aggregation allows service providers to offer concurrent broadband access services to multiple types of access networks, spreading the cost of aggregation services across different customer types. In situations where

subscribers purchase additional IP services, these services are preserved on the SER as subscribers migrate from one type of access technology to another. The benefit is reduced disturbance of the subscriber base. For PPPoA, PPP/L2TP, and PPP/HDLC connections, bandwidth-on-demand services are also supported through multilink PPP.

Unlike many broadband remote-access servers in the market today, the Nortel Services Edge Router 5500 differentiates itself by the built-in IP services capability that enables seamless deployment of high-touch services to broadband subscribers. The service capacity of any broadband access network must grow along with the subscriber base. With distributed architecture, the Nortel Services Edge Router 5500 can terminate 32 000 subscribers per chassis, or 128 000 subscribers per seven-foot rack. Because the SER supports both aggregation and IP services, service capacity associated with subscription is not compromised.

- **Advanced wholesaling:** The Nortel Services Edge Router 5500 allows access providers to expand their business models through a number of advanced wholesaling features. Logical virtual routers, in the form of ISP contexts with independent administrative domains coupled with a flexible set of L2TP tunneling and switching capabilities, enable service providers to create different outsourced or self-managed wholesale models. Authentication mechanisms, which complement these wholesale features, are equally flexible because of the extensive use of subscriber templates and RADIUS-based configurations.
- **IP-VPNs:** Enterprises turn to virtual private networks to lower the total cost of WAN connectivity. While IP-VPNs are often positioned as a low-cost alternative to layer 2 VPNs, the true value of IP-VPNs is the ubiquitous nature of the underlying TCP/IP protocol. Because IP has proliferated in

private and public networks, an IP-based VPN can easily expand its boundaries from fixed sites out to individual users over the Internet. IP applications can take full advantage of the network services uniquely designed for them, based on a set of predefined service policies. Ready for these applications and more, the Nortel Services Edge Router 5500 runs some of the largest network-based IP-VPNs.

- **Universal IP-VPNs:** The Nortel Services Edge Router 5500 network-based IP-VPNs or virtual private routed networks (VPRNs) rolls out rapidly and inexpensively to many enterprises over a common network of SERs. Functioning as either a provider edge router or a label edge router, the SER supports various VPN membership, VPN discovery, and tunneling mechanisms, making it suitable for deployment in both IPsec-VPN and MPLS-VPN environments. With support for the Nortel VPN Client termination, both site-to-site and remote access VPNs can offer integrated services over a common Nortel Services Edge Router 5500 platform. This complete solution has the advantages of ubiquitous access and common policy control, allowing a VPN to grow without excessive cost and management overhead.

For enterprises that are not ready to outsource their remote access services, the Nortel Services Edge Router 5500 can support L2TP tunneling as a virtual private dial-up network (VPDN) service. Through a comprehensive suite of capabilities over a common Nortel Services Edge Router 5500 platform, service providers can now offer a flexible set of network-based intranet, extranet, and remote access IP-VPN services.

- **Additional IP-VPN services:** While reducing the cost of IP-VPN deployment through the Nortel Services Edge Router 5500 network-based offering, the value of these solutions increases by using the high-touch IP services already built into each system. A common set of network policies, variable for different sites or remote subscribers, can apply dynamically at

the SER before admittance into the destined VPRN. These network-based IP service policies relate to private IP address use, firewall rules, content filtering, traffic shaping, and a host of other IP services. For example, a firewall policy can allow a VPN site to directly access the Internet without routing through a firewall at the corporate headquarters, thereby reducing delay and a potential bottleneck.

While many network-based IP-VPNs are provisioned through route configuration and tunnel setup between VPN nodes, a Nortel Services Edge Router 5500-based VPRN uses both its knowledge of VPN subscribers (during authentication) and the layout of the SER-based network to offer network-wide intelligence. These can include intelligent meshing, a dynamic tunnel setup, and a tear-down mechanism based on existing VPN traffic, or network-wide VPRN accounting. Network level intelligence offers tremendous cost savings in running and operating universal IP-VPN services and is equally applicable for either IPsec- or MPLS-based IP-VPNs.

While the traditional IP VPN market focuses only on site-to-site connectivity, Nortel Services Edge Router 5500 enables service providers to add sophisticated remote access, extranet, and simultaneous VPN plus Internet capabilities. The full range of IP services can also apply to enterprise end users.

- **Advanced high-touch IP services:** The Nortel Services Edge Router 5500 provides a rich set of value-added high-touch IP services, enabling service providers to grow their top line services revenue. These services include a wide range of security, CoS, and traffic steering services.
- **IP security services:** Anchoring the Nortel Services Edge Router 5500 IP security suite is the first network-based ICSA-certified state-aware firewall. The Nortel Services Edge Router 5500 state-aware firewall is centrally managed and provides a sophisticated user interface to

define firewall rule sets. The Nortel Services Edge Router 5500 firewall can track complex IP applications such as H.323 or SIP-based VoIP services. By extracting key parameters from the associated control plane, consistent firewall policy filters can apply to entire conversations instead of limited traffic flows. Proper configuration protects subscribers from certain types of denial of service attacks. Over 2 million Nortel Services Edge Router 5500 firewall licenses have sold since the first product shipment.

To complete the suite of IP security services, the Nortel Services Edge Router 5500 supports anti-spoofing to prevent a hacker from impersonating legitimate users, NAT to protect user IP addresses, and IPsec data encryption to protect data content in transition. For security management, logging occurs for these security services and that data can feed into reporting systems for analysis.

A flexible set of authentication services complement the Nortel Services Edge Router 5500 IP security services; these services use RADIUS, LDAP, proxy SecureID, and CHAP/PAP negotiations for PPP subscribers. For security services, such as content filtering, intrusion detection or anti-virus protection, Nortel continues to work with a number of industry-leading partners to offer complete solutions for network-based deployments.

- **IP-CoS services:** As the networking community realizes that the quality of service (QoS) in traditional connection-oriented networks is impractical in IP networks, the industry is moving toward a practical alternative: IP class of service (CoS). The concept behind IP CoS relies on marking and classifying IP packets; then, nodes within the network can apply the necessary packet processing based on a number of traffic engineering techniques and queuing algorithms. Depending on transport

infrastructure, the classified IP flows map to QoS features associated with the underlying transport services.

The Nortel Services Edge Router 5500 supports a full range of IP CoS features that can combine to enable tiered services based on subscribers or applications. From an SER service provisioning perspective, the IP CoS services include diffServ marking, L3 traffic shaping, and L3 traffic policing. The SER traffic shaping implementation can be flow-based or rule-based, with optional rate-limiting capabilities based on service class or service connection. For traffic policing, support exists for both single-rate three-color marker (SRTM) and two-rate three-color markers (TRTM). Last, but not least, the Nortel Services Edge Router 5500 can map L3 classes to L2 ATM virtual circuits to take advantage of any underlying ATM QoS services. For Ethernet access, support exists for VLAN-based 802.1P priority mapping. The Nortel Services Edge Router 5500 IP CoS services are expected to play an increasing role in the support of certain time sensitive traffic over an integrated IP network and also in the support of service level agreements (SLA) for tiered services.

- **IP traffic steering services:** The Nortel Services Edge Router 5500 vision of network-based services includes present and future high-touch IP services. These value-added capabilities can range from dedicated server-based traffic processing to distributed content subscription and delivery networks. The underlying assumption is that a subscriber-aware broadband service node is ideally positioned to bridge subscribers to their desired network services and content which, in turn, allows service providers to evolve their service offerings and business models. A number of IP traffic steering capabilities, also known as SER service delivery interfaces (SDIs), are designed into the Nortel Services Edge Router 5500 iSOS system to enable integration with service capabilities that are

external to the SER. SDIs supported by SER iSOS today include Web steering (WS), policy-based forwarding (PBF), and personal content portal (PCP).

Web steering redirects HTTP-based traffic to a proxy, cache, or content-filtering server external to the SER for related services. Because these services are typically not deployed locally to the SER, the Web steering SDI incorporates automatic network address translation, support for up to 254 remote servers, and a built-in service health check.

Policy-based forwarding is an extremely flexible SDI supported on any physical or virtual interface. It allows a traffic policy to be set up for ingress traffic to bypass normal route lookup and forwards the traffic toward the predetermined next-hop interface based on policy rule-match.

Personal content portal (PCP) is perhaps the most powerful SDI of all. An application that incorporates the PCP API set can transparently intercept a subscriber HTTP session and hold the subscriber captive, push a Web page to the subscriber, release the subscriber to the intended HTTP destination, or temporarily replace the subscriber service policies. Because a timer function is built into PCP, the subscriber is held captive at any time desired, which allows a service provider to have full control over subscriber services. Because PCP provides only the subscriber control mechanism for the PCP application, the power of PCP-based services is limited only by the creativity in the definition of the applications. The application can be as simple as pushing a welcome page to the subscriber or as forward-looking as offering a selection of personalized content and on-demand network services.

Market Information

Nortel solutions are the engines behind some of the largest network-based service provider IP-VPNs and award-winning DSL broadband services in North America, and are today provisioned worldwide. These solutions meet the evolving demands of vast carrier networks and individual enterprise requirements alike.

Technical Specifications

Dimensions	• Width: 48.26 cm (19 in.) • Height: 48.9 cm (19.25 in.) • Depth: 45.72 cm (18 in.) • 11 Rack units (RU): 4 per 2.13 m (7-ft) rack
Weight	• 61 kg (135 lb) fully loaded • 18 kg (39 lb) empty
dc power	• 1500 watts fully loaded • -38V dc min to -60V dc max • 40 Amps
ac power	• 90 to 260 Vac @ 50 to 60 Hz • 60 Amps 16 Amps per input
Safety	• UL 1950, CSA 950, CE Mark
EMI	• FCC Part 15 Class A • EN 550 22A Altitude • -60m to 3048 m (-197 to 10 000 ft)
General system characteristics	• 14 slots modular chassis at 622 Mb/s or 1.2 Gb/s full duplex operation • Logical backplane for non-stop operation • Hot-swap and redundancy support for all modules • Distributed dc entry (ac optional) • 4 systems per 7-foot telco rack
System modules	• One or two Control and Management Card (CMC) modules providing routing and management for the system, each equipped with 2 Fast Ethernet ports and 3 management ports (Serial, Aux, Fast Ethernet) • One or two 2.5, 5, or 10 Gb/s nonblocking Switch Fabric Cards (SFC) with full per-flow queuing • Up to 6 Subscriber Service Cards (SSC), each with up to 4 Subscriber Service Modules (SSMs) processor groups
Interface modules	• 4 port OC-3/STM-1 ATM (SM or MM) • 2 port OC-12/STM-4 ATM with optional APS (SM or MM) • 3 port DS3/E3 plus 1 port OC-3/STM-1 ATM (SM or MM) • 4 port Channelized DS3 • 2 port Channelized STM-1 (SM or MM) • 1 port Gigabit Ethernet (SM or MM) • 8 port Fast Ethernet
Connectivity/access services	• RFC - 1661 PPP • RFC - 1662 PPP in HDLC-like Framing • RFC - 1973 PPP in Frame Relay • RFC - 1990 PPP Multilink Protocol • RFC - 2364 PPP Over AAL5 (or PPPoA) • RFC - 2516 PPP Over Ethernet (or PPPoE) • RFC - 2661 Layer Two Tunneling Protocol - L2TP – LAC/LNS – Intelligent tunnel switching and load balancing • RFC - 1490 Bridged/Routed IP Over Frame Relay (Now RFC 2427) • RFC - 1483 Bridged/Routed IP Over ATM (Now RFC 2684) – Independent bridged subnets – Bridge groups • RFC - 2401 IPSec • RFC - 2784 GRE • IEEE 802.1Q Virtual LANs • IPDemux • L2TP over IPSec • RFC 1542 - DHCP Relay • RFC 2138/2139 Radius

Routing services	• RFC – 1058 RIP v1 • RFC – 2453 RIP v2 • RFC – 2328 OSPF v2 • RFC – 1771 BGP v4 (including RFCs -1997, 1966, 2439, 1965) • RFC – 1142 IS-IS (Trunk only) • RFC – 2236 IGMP v2 Proxy
Authentication access services	• RFC – 2138, 2139 RADIUS • RFC – 2251 LDAP • Proxy SecureID (RSA Certified)
IP-VPN services	• VPN deployment models • Virtual Private Routed Networks (VPRN) — RFC 2764-based IP VR-VPNs • BGP/MPLS VPN : RFC 2547-based VRF-VPNs • Virtual Private Dial Networks (VPDN) • Virtual Leased Lines (VLL) • Remote Access VPN – Termination of Windows-based Nortel VPN Client – VPRN Topology Optimization: Intelligent Meshing, Hub and Spoke • Tunneling: L2TP, IPsec, L2TP/IPsec • Encryption: AES (128-bit), 3DES, DES • Hash Algorithms: SHA-1, MD-5 • Key Management Algorithm: Asymmetric cryptography, Diffie Hellman Group 1 (768 bits) and Group 2 (1024 bits) • Encapsulation: ESP • ESP IPsec Mode: Tunnel Mode, Transport Mode (L2TP/IPsec only) • Control Path : IKA SA negotiation – Phase 1 — Main Mode, Aggressive Mode (for Nortel VPN Clients only) – Phase 2 — Quick Mode, with optional PFS • Authentication: Preshared keys for static tunnels, RADIUS for user authentication • Hub-spoke topologies with both MPLS and IPsec VPNs • Management VPNs for Managed CPE based services using MPLS backbones • Explicit FEC—an intelligent mechanism to differentiate and prioritize between different traffic types in an MPLS VPN
Service Creation System (SCS) system specifications	SCS System server modules • Domain Server • Regional Server • LDAP Server • Pull Server • Log Server • CORBA Server • Service Management Center CNM Server SCS system interfaces • Command Line Interface (CLI) • SNMP (Agent and Proxy) • CORBA API • RADIUS • Accounting and Service Log Files (XML, Binary or ASCII formats) • Personal Content Portal (PCP) Software Development Kit

Ordering Information

For further information, contact your local Nortel representative.

Nortel Optical Metro Platforms

Nortel Optical Metro Platforms are innovative next-generation multiservice platforms that offer dense wavelength division multiplexing (DWDM) with various services, including time division multiplexing (TDM), storage, and Ethernet. The Nortel Optical Metro 3000 series is a family of leading-edge next-generation SONET platforms that offer extensive bandwidth management capabilities, Resilient Packet Ring technology, and support for a variety of services such as time division multiplexing (TDM), storage, and Ethernet. The Nortel Optical Metro 5000 series, including the 5100, 5200, and 5200 E/C, harnesses the power of DWDM to transparently deliver high-bandwidth network services across an open, scalable, and survivable optical transport platform.

The Nortel Optical Metro Platforms include:

- Nortel Optical Metro 3000 series
 - Nortel Optical Metro 3400
 - Nortel Optical Metro 3500
- Nortel Optical Metro 5000 series
 - Nortel Optical Metro 5100
 - Nortel Optical Metro 5200
 - Nortel Optical Metro 5200 Cabinet
- Nortel Common Photonic Layer

Nortel Optical Metro 3000 Series

Overview

The Nortel Optical Metro 3000 series is a family of market-leading next-generation SONET platforms that provide differentiated data and storage services on existing networks. The Optical Metro 3000 series architecture is fully nonblocking to provide scalable and unrestricted bandwidth management capabilities. The innovative service modules enable the highest density service termination in the industry without stacking multiple shelves. The Nortel Optical Metro 3000 series is equipped with Resilient Packet Ring (RPR) technology, generic framing protocol (GFP) service mapping, virtual concatenation (VCAT), and storage compression with distance extension that enables efficient bandwidth use with a full suite of native rate client data and storage interfaces. Major service providers and enterprises deploy the Nortel Optical Metro 3000 series, which is continuously recognized as one of the market-leading solutions.

Ideal For

Mid-sized enterprise sites with mission-critical applications or services that are best transported over a next-generation SONET network, including:

- optical Ethernet transport and switching to meet the increasing bandwidth and QoS performance needs of enterprise organizations that deploy CRM, IP telephony, collaborative applications, Web-based applications, and IP-video solutions
- site interconnect or LAN extension services needed to support network or server consolidation goals
- high-speed Internet access for enterprise data centers to support customer contact and employee mobility
- storage area networking (SAN) over SONET networks to meet business continuance and disaster recovery needs or to comply with industry and government regulations

Business Challenges

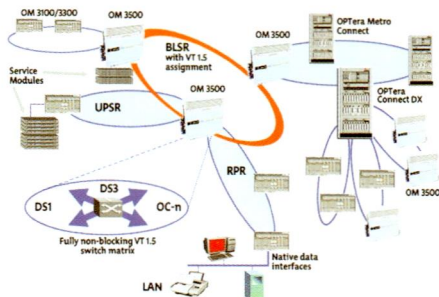
- Does your business have an ever-increasing demand for bandwidth and performance?
- Can your network support the QoS and scalability required for new applications and services?
- Do you have specific networking or storage requirements that need to be addressed?
- Do you want to reduce the cost and complexity of your metro network?
- Can your Internet connectivity meet your requirements for scalability, flexibility and resiliency?
- Do you have a proven disaster recovery and/or business continuance plan?

- Is your storage reliable and secure?
- Are your insurance premiums for "business disruption" policies increasing?

Typical Applications

- Full-rate and sub-rate storage extension (fiber channel and FICON) and Gigabit Ethernet over SONET/SDH to extend reach between enterprise sites to thousands of miles.
- Real-time disk mirroring using FICON or fiber channel or Gigabit Ethernet
- Multiservice aggregation of voice, data, and storage.
- Link geographically dispersed enterprise local area networks with any-to-any Layer 2 connectivity and RPR.
- School districts, colleges, universities—converged voice, data and video network to deliver next-generation education applications.
- Local, state and federal institutions—link government, business, and citizens.
- Financial service, banks, insurance companies—transport and store mission-critical financial data.
- Health Maintenance Organizations (HMOs), hospital systems, health services to distribute and store medical imaging and records.
- Manufacturing: high-tech, automotive, publishing – scalable networks that enable collaborative file sharing and e-commerce.

Network Diagram



Network diagram of typical deployment

Key Points

The key points of the Nortel Optical Metro Platform series include:

- **Simple:** lowers the total cost of ownership by removing bandwidth bottlenecks and providing transparent support for existing and new enterprise applications and services
 - a flexible network architecture that is suitable for core and enterprise network installations
 - compatible with all common optical data communication protocols
 - remote network management
- **Scalable:** up to 48 wavelengths per fiber¹ and up to 10 Gb/s on each wavelength
 - extended distance support using amplified solutions
 - wavelength capacity to quickly add bandwidth¹
 - multiservice support: DS1, E1/DS1, DS3/VT Transmux, DS3, EC-1/STS-1, OC-1, OC-3, OC-12, OC-48, OC-192, Ethernet (10/100 Base-T, 100 Base-FX, and 1000 Base-SX/LX) and storage interfaces (FICON and fiber channel with distance extension and compression)
- **Resilient:** carrier grade, 99.999 percent availability is a key requirement for business continuity
 - less than 50 milliseconds cut-over time to an alternate network path
 - in-service upgrades to hardware and

software

- generic framing protocol (GFP) interfaces enable storage protocol transport directly over existing SONET networks to enable enterprises to take advantage of SONET resiliency and availability
- **Secure:** supports security features that block intrusion attempts and hacking tools
 - enables centralized user access management through RADIUS servers
 - supports challenge and response mechanism that addresses many security issues associated with sending authentication information over unsecured links

Features and Benefits

Nortel Optical Metro 3400

The Nortel Optical Metro 3400 provides multiservice aggregation at medium-density sites with a wide variety of services such as TDM (DS1, DS1/E1, Transmux, DS3, STS-1, OC-1, OC-3, and OC-12) and Ethernet (10/100 Base-T) and is scalable from OC-3 to OC-12 without interrupting existing services. The fully nonblocking switching architecture offers unrestricted bandwidth management capabilities and enables cost efficient delivery of voice, video, and data traffic in the metropolitan area.

The Nortel Optical Metro 3400 supports a wide array of optical hub capabilities and self-healing ring topologies. The flexible universal service

interface slots can support any service mix without architectural limitations or complex engineering rules.

Nortel Optical Metro 3500

The Nortel Optical Metro 3500 is a cost-effective and versatile next-generation SONET platform that offers TDM, Ethernet and storage services, and is fully scalable from OC-3 to OC-12/OC-48/OC-192 in a single shelf.

The series provides multiservice aggregation in high-density sites from TDM (DS1, DS3, Transmux, STS-1, OC-3, OC-12 and OC-48) and Ethernet (10/100 Base-T, 100 Base FX and Gigabit Ethernet¹ over GFP/CAT/LCAS or RPR) to storage (fiber channel and FICON). The series is scalable from OC-3 to OC-192 with integrated DWDM optics (48 wavelengths) and its nonblocking switching architecture offers the highest bandwidth management flexibility in the industry while enabling cost-efficient delivery of voice, video, and data traffic in the metropolitan area.

Further, the series offers the following benefits:

- storage interfaces with both storage extension and compression, allowing users to realize tangible operational and economic benefits as compression efficiencies can range from 2:1 to over 20:1, and higher.
- point-to-point, survivable ring (RPR, UPSR, and BLSR) and mesh topology including multiple ring support provide flexibility in planning and deploying these solutions to support enterprise applications and services
- cost-effective bandwidth with a high degree of scalability, enhanced granularity and low cost per Mb/s through 24 protected and up to 48 unprotected wavelengths in one system with mixed configurations possible
- DWDM support for operational simplicity and fiber efficiency
- continuously available business applications and services through per wavelength and in-band optional protection switching, and fiber switching
- SDH /SONET path trace and performance monitoring capabilities help troubleshoot and solve problems

- resiliency is maintained using in-service upgrade by remote software download
- flexible design options with support for 850 to 1310 nm interfaces and single-mode or multimode fiber support
- accessible by network managers using TCP/IP-based network management communications
- amplifier support for extended distance networks (up to approx 200 km depending on fiber)
- optical network modeling tool for simplified network deployment, upgrades, and planning

Resilient Packet Ring

The Optical Metro 3400 and Optical Metro 3500 support Resilient Packet Ring (RPR). RPR acts as a distributed switch between various remote locations enabling businesses to cost-effectively implement and operate a flexible and scalable metropolitan network. By sharing the bandwidth of the optical ring, RPR yields significant fiber efficiency that can be quickly upgraded and expanded as the number of enterprise sites and their bandwidth requirements grow.

RPR offers native Ethernet interfaces that are common in enterprise IT networks to eliminate the need for costly and complex adaptation devices. Organizations realize savings on both network adaptation equipment as well as network interface investments.

Nortel pioneered RPR and owned the first commercial RPR deployment in 1999. Since 1999, RPR has since been standardized by the IEEE 802.17 working group. RPR provides interoperability between multi-vendor equipment. The key benefits of RPR include:

- high bandwidth delivery
- cost-efficient bandwidth sharing between sites
- support for eight Classes of Service, allowing for differentiated Service Level Agreements
- native-rate Ethernet transport with carrier-grade availability and scalability
- connectionless, packet-based networking
- reduced need for external routers and DS-1/VT-1.5 facilities between LAN locations
- seamless inter-working with SONET and IP networks

- ability to support a mix of packet and TDM traffic over the same network
- restoration times of less than 50 ms in the case of fiber cut or node failure

Technical Specifications

	Nortel Optical Metro 3400	Nortel Optical Metro 3500
Optical interfaces	• OC-1, OC-3, OC-12	• OC-3, OC-12, OC-48, OC192
TDM interfaces	• DS1, DS3, Transmux, STS-1	• DS1, DS3, Transmux, STS-1
Ethernet interfaces	• 10/100 Base-T	• 10/100 Base-T, 100 Base-FX, 1000 Base-SX/LX (GigE) over GFP/VCAT/LCAS or RPR
Storage interfaces		• FICON and fiber channel with distance extension capabilities and compression
		

Market Information

- Number one worldwide for metro DWDM².
- Number one in multi-service SONET/SDH³.
- Number one in Ethernet over SONET/SDH⁴.
 - Number one worldwide Ethernet over SONET/SDH for 2003 and 2004, 2005⁵.
 - Number one worldwide Ethernet over WDM for 2003 and 2004, 2005⁵.
- First complete optical engineering certification program.
- First commercial optical Ethernet network.
- First with 10-Gb Ethernet WAN.
- First with Layer 2 resilient packet rings and distributed MPLS VPNs.
- Nortel developed GFP and worked with ITU for standardization.
- Chair CWDM ITU standardization committee and RPR alliance.
- In some regions Nortel provides a fiber acquisition service for enterprise channel partners because locating fiber on which to build these solutions can be difficult.

Nortel Optical Metro 5000 Series

Overview

The Nortel Optical Metro 5100/5200 platform delivers coarse and dense wavelength division multiplexing (C/DWDM) capabilities for enterprises that need resilient optical transport services across a single fiber pair. The Nortel Optical Metro 5100/5200 is protocol- and bit-rate-independent to enable open, flexible, and scalable networking across multiple topologies. Enterprise locations over hundreds of kilometers (or miles) apart can network with this cost-effective, forecast-tolerant, transport solution. The Nortel Optical Metro 5100/5200 simplifies network planning and reduces operating costs, while providing scalable capacity and carrier-grade resiliency.

Ideal For

The Nortel Optical Metro 5100/5200 platform can operate in several enterprise vertical applications, including health care, finance, education, government, utilities, and manufacturing.

The Nortel Optical Metro 5100/5200 is well suited for enterprise organizations with mission-critical applications or services, including:

- storage area networking (SAN) to meet business continuance and disaster recovery needs or to comply with industry and government regulations
- digital information services including, X-rays, MRIs, ultrasound graphs, video and media production, intellectual property, financial data and customer information
- large-scale grid computing for applications such as climate, genomic, geophysical and astrophysics research, and engineering and design
- enterprise data centers with increasing needs for performance, resiliency, and scalability

Business Challenges

- Does your business create an ever-increasing amount of digital information?
- Is your storage reliable and secure?
- Do you have specific networking or storage requirements that need to be addressed?
- Are your insurance premiums for business disruption policies increasing?
- Do you have a proven disaster recovery and/or business continuance plan?

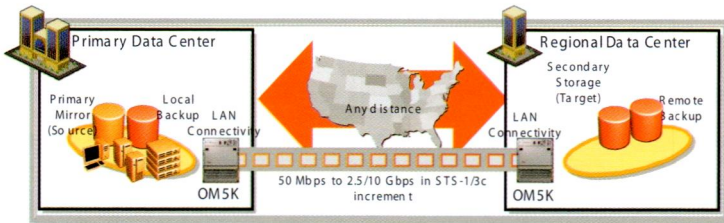
Typical Applications

Digital content represents the lifeblood of a company. To mitigate the risk of loss, enterprises

increasingly adopt storage extension into their enterprise data centers. These technologies can replicate business-critical data to a secondary remote site. Transmitting this information over distances of up to 400 km requires the following key components provided by the Nortel Optical Metro 5100/5200 platform:

- Carrier-grade performance with zero data loss
 - scalable throughput
 - low latency
 - low jitter
 - high security
- LAN interconnection using 10 Gigabit Ethernet (WAN PHY and LAN PHY), 1 Gigabit Ethernet, ATM, or fast Ethernet
- remote data storage using ESCON or fiber channel (FC100 and/or FC200)
- geographically dispersed storage and processing using ESCON, FICON or Gigabit Ethernet or 10 Gigabit Ethernet
- full-rate and sub-rate storage extension (fiber channel) and Gigabit Ethernet over SONET and SDH to extend reach between enterprise sites to hundreds or even thousands of miles
- Real-time disk mirroring using ESCON or fiber channel with SRDF
- IBM zSeries interconnectivity for disaster recovery and continuous availability using geographically dispersed parallel sysplex (GDPS)
- PBX interconnection using aggregation with SDH and SONET or ATM (E1s/T1s into STM-1/OC-1)
- Internet access via packet over SDH/SONET (POS) or Gigabit Ethernet
- live news feeds, high-quality digital video, and more

Network Diagram



Key Points

The key points of the Nortel Optical Metro series include:

- **Simple:** lowers total cost of ownership by removing bandwidth bottlenecks and providing transparent support for existing and new enterprise applications and services
 - a flexible network architecture suitable for core and enterprise network builds
 - compatible with all common optical data communication protocols
 - interfaces are bit-rate, data format, and protocol independent
 - remote network management
- **Scalable:** up to 32 protected wavelengths per fiber (on Nortel Optical Metro 5200) and up to 10 Gb/s on each wavelength
 - extended distance support using amplified solutions with optional dispersion compensation
 - wavelength capacity to quickly add bandwidth
- **Resilient:** carrier grade, 99.999 percent availability is a key requirement for business continuity
 - less than 50 milliseconds cut-over time to an alternative network path
 - in-service upgrades to hardware and software
 - certified solutions with IBM, EMC, Brocade, Sun, and Dell

Features and Benefits

- protocol independent and bit-rate independent interfaces give enterprises the flexibility to transport numerous protocols (for example, Ethernet, IP, SNA, ESCON, FICON, fiber channel, voice, and video) over the

same optical system with scalability of up to 10 Gb/s per wavelength for each application

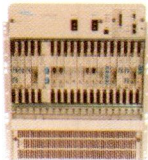
- point-to-point, survivable ring and mesh topology including multiple ring support provides flexibility in planning and deploying this solution to support enterprise applications and services
- sub-rate multiplexers and Muxponder cards that package multiple services on a single 2.5 Gb/s or 10 Gb/s wavelength
- cost-effective bandwidth with a high degree of scalability, enhanced granularity, and low cost per Mb/s using 32 protected and up to 64 unprotected wavelengths in one system with mixed configurations possible
- cost-effective network solutions using CWDM for up to 8 wavelengths and reaches of up to 80 km
- DWDM and CWDM support for operational simplicity and fiber efficiency
- continuously available business applications and services through per wavelength and in-band optional protection switching, and fiber switching
- System Level Equalization (R8.0) for automated system-wide equalization when active components are in the system to provide simplified operations and intelligence to the optical layer
- resiliency is maintained using in-service upgrade by remote software download
- flexible design options with support for 850 to 1310 nm interfaces and single-mode or multimode fiber support
- accessible by network managers using TCP/IP based network management communications
- amplifier support for extended distance

networks (over 400 km depending on fiber and amplifier locations)

- optical network modeling tool for simplified network deployment, upgrades and, planning
- the Nortel Optical Metro 5100 and 5200 share

common interface cards and software for deployment, management, sparing, and overall operations simplicity

Nortel Optical 5000 series comparison:

Nortel Optical Metro 5100	Nortel Optical Metro 5200	Nortel Optical Metro 5200 Cabinet
The space-efficient Nortel Optical Metro 5100 is a low-power optical product for small bandwidth requirements that serve metro collocation and customer premise applications. It quickly and economically delivers 8 protected wavelengths of CWDM service to metropolitan collocation and customer premise applications. With the 10 G transponder, the Nortel Optical Metro 5100 becomes one of the smallest 10 G capable platforms in the market (offering two 10 G transponders in 5U of rack space).	The flexible Nortel Optical Metro 5200 Multiservice Platform supports 32 protected DWDM wavelengths and offers scalability of up to 10 G on each wavelength. A network modeling tool is available to simplify the deployment and operation of this efficient DWDM network solution.	The freestanding Optical Metro Cabinet 5200 is an easy-to-deploy DWDM cabinet solution that extends the Nortel Optical Metro 5200 functionality and flexibility to metropolitan enterprise and customer premise environment applications. This cabinet delivers the benefits of the Nortel Optical Metro 5200 Multiservice Platform in a pretested and preconfigured cabinet. The Optical Metro Cabinet 5200 solution can help businesses reduce installation time and speed deployment by up to 82 percent.
		

Market Information

- Number 1 optical networking vendor globally.
- Number 1 worldwide for metro WDM for the past seven years.
- Number 1 worldwide for total WDM for the past six years.
- Number 1 in Ethernet over WDM.
- First complete optical engineering certification program.
- First commercial optical Ethernet network.
- First with 10-Gb Ethernet WAN.
- First with layer 2 resilient packet rings and distributed MPLS VPNs.
- Nortel developed GFP and worked with ITU for standardization.
- Chair CWDM ITU standardization committee and RPR alliance.
- In selected markets, Nortel provides a fiber acquisition service for enterprise channel partners because locating fiber on which to build these solutions can be difficult.

Technical Specifications

	Nortel Optical Metro 5100	Nortel Optical Metro 5200
Optical storage connectivity	• ESCON/SBICON • FICON/FICON Express/ FC-SB-2 • ISC, ISC-2, HiPerLink, ISC-3 • ETR/CLO sysplex timer • Fiber Channel: FC-12, -25, -50, -100 • Fiber Channel - FC-200	• ESCON/SBICON • FICON/FICON Express/FC-SB-2 • ISC, ISC-2, HiPerLink, ISC-3 • ETR/CLO sysplex timer • Fiber Channel: FC-12, -25, -50, -100 • Fiber Channel: FC-200
Optical Ethernet	• Fast Ethernet (100 Base-FX) • Gigabit Ethernet (1000Base-SX, -LX) • 10GE WAN PHY • 10GE LAN PHY	• Fast Ethernet (100Base-FX) • Gigabit Ethernet (1000Base-SX, -LX) • 10GE WAN PHY • 10GE LAN PHY
Private leased lines	• ATM, SONET (OC-1 to OC-192) • ATM, SDH (STM-1 to STM-64) • Async FOTS, PDH - 150Mb/s, 565Mb/s • Ethernet and Storage Private Line (GFP mapping, interwork with SONET/SDH)	• ATM, SONET (OC-1 to OC-192) • ATM, SDH (STM-1 to STM-64) • Async FOTS, PDH - 150Mb/s, 565Mb/s • Ethernet and Storage Private Line (GFP mapping, interwork with SONET/SDH)
Managed wavelength services	• 8Mb/s - 2.5Gb/s flexible rate • 10Gb/s wavelengths • C CIR-601 / ITU-R 601, HDTV, DVB-ASI, DV6000, PrismaDT • FDDI	• 8 Mb/s - 2.5Gb/s flexible rate • 10Gb/s wavelengths • C CIR-601 / ITU-R 601, HDTV, DVB-ASI, DV6000, PrismaDT • FDDI
Supported configurations	• CWDM wavelengths protected and 16 unprotected per system • Optical amplifiers allow for 600-km regenerator free transmission • Point-to-point, Linear OADM, Hubbed ring, Dual-hubbed ring, Meshed ring, interop with Optical Metro 5100 • Point-to-point, Linear OADM, ring, interop with Optical Metro 5200	• 32 DWDM wavelengths protected and 64 unprotected per system • Optical amplifiers allow for 600-km (373 mi) regenerator free transmission • Point-to-point, Linear OADM, Hubbed ring, Dual-hubbed ring, Meshed ring, interop with Optical Metro 5100
Protection schemes	• Path switching, equipment switching, line switching, unprotected	• Path switching, equipment switching, line switching, unprotected
Operational	• Optical connectors FC, SC, MT-RJ, LC	• Optical connectors FC, SC, MT-RJ, LC
Communication ports	• 2 10BaseT (Ethernet) ports • 1 RS-232 25-pin	• 2 10BaseT (Ethernet) ports • 1 RS-232 25-pin
External alarms (Telemetry ports):	• 8 inputs, 4 outputs	• 4 inputs, 4 outputs
Element/Network management	• SNMP v1, TL-1, System Manager, Optical Network Manager	• SNMP v1, TL-1, System Manager, Optical Network Manager
Temperature	• 0° to 55°C (32° to 131°F) Relative humidity • 5% to 95% (noncondensing)	• 0° to 55°C (32° to 131°F) Relative humidity • 5% to 95% (noncondensing)
Certifications	• Zone IV (earthquake) • GR-63-CORE (NEBS) Telcordia • ETS 300 019 ETSI • OSMINE compliant	• Zone IV (earthquake) • GR-63-CORE (NEBS) Telcordia • ETS 300 019 ETSI • OSMINE compliant

	Nortel Optical Metro 5100	Nortel Optical Metro 5200
Power consumption/ shelf	• 139 Watts typical, 202 Watts max	• 534 Watts typical, 730 Watts max
Power requirements (nominal)	–48 V dc Minimum: –40 V dc Maximum: –60 V dc ac interface available	–48 V dc Minimum: –40 V dc Maximum: –60 V dc ac interface available
Shelf dimensions	Height: 17.6 cm (6.92 in.) Width: 43.8 cm (17.25 in.) Depth: 29.7 cm (11.7 in.) Weight: 14.5 kg (32 lb) empty; 16.5 kg (36 lb) (fully loaded) Universal mounting brackets for 48.25 cm (19 in.) or 58.4 cm (23 in.) frames	Height: 48. cm (19.25 in.) (11U) Width: 43.8 cm (17.25 in.) Depth: 30.1 cm (11.85 in.) Weight: 23 kg (50 lb) empty; 34 kg (75 lb) fully loaded

Ordering information

For further information, contact your local Nortel representative.

Nortel Common Photonic Layer

Overview

The Nortel Common Photonic Layer (CPL) removes the complexity of dense wavelength division multiplexing (DWDM) photonic networking by developing the necessary intelligence, automated functions, and control into the optical transport layer hardware and software. By simplifying delivery, from the planning phase to the turn-up phase, the CPL reduces time to service through new operational tools and architecture flexibility. The platform efficiently delivers value-rich services and unlocks new applications end to end while reducing the total cost of ownership.

Ideal For

The Nortel Common Photonic Layer offers enterprises a cost-optimized solution to transport telephony, data, video, and cable services in metro, regional, and long-haul networks.

Business Challenges

The business challenges to consider when deciding to purchase the Nortel Common Photonic Layer include:

- Does your business need a platform that can efficiently deliver end-to-end intelligent network services and reduce the cost of ownership?
- Does your company want to eliminate network boundaries by creating one converged, easy-to-operate, all-optical network?
- Does your organization want a cost-optimized solution to transport telephony, data, video, and cable services in metro, regional, and long-haul networks?

Key Points

The key points of the Nortel Common Photonic Layer include:

- The Nortel Common Photonic Layer simplifies the transport layer so that

multiservice switches, DWDM terminals, optical core switches, and other service elements that connect to it have their services efficiently carried end to end.

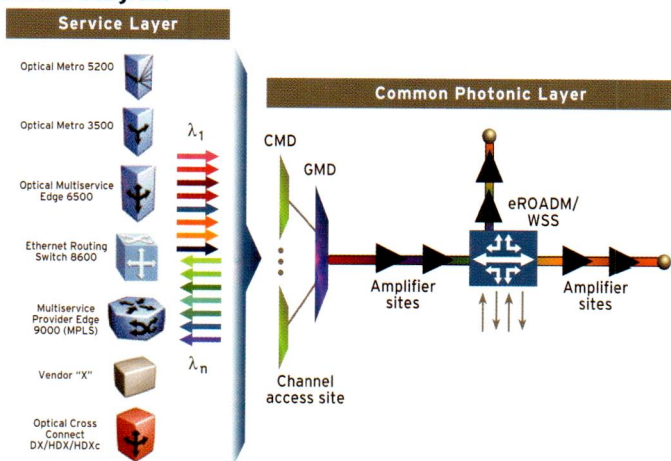
- CPL introduces new and simple levels of operation and provides automated functions.
- CPL offers an initial system with a small footprint that scales modularly. CPL provides a pay-as-you-go structure that can grow as revenue-generating opportunities or capacity prohibit drive expansion of the network.
- CPL offers network flexibility with an eROADM (Enhanced Reconfigurable Optical Add/Drop Multiplexer) architecture that delivers any wavelength, anywhere, anytime, with no effect to the existing traffic.

Typical Applications

Typical applications of the Common Photonic Layer include:

- **Enterprise customers** that deploy their own privately managed DWDM system, or a carrier-managed private network for applications such as LAN interconnect, optical storage connectivity, network convergence applications, applications that require compliance with new industry regulations regarding distance extension, and business continuity applications.

Network Diagram



Features and Benefits

The Common Photonic Layer is a self-optimizing, agile DWDM transport platform designed for cost-effective metro, regional, and long-haul networks. The features and benefits of the CPL are as follows:

- The modular design of the CPL offers cost-effective reach and capacity solutions tailored to network needs.
- The CPL is compatible with any of the Nortel optical network products and supports other vendor network elements for open photonic connectivity.
- CPL offers automated functions and tools to facilitate and accelerate the various network deployment phases that include network planning, network commissioning, system line-up and testing, incremental wavelength additions, and remote reconfiguration.
- The CPL provides savings in footprint and power due to the simplified optical layer, the modular design, and the power efficiency.

Market Information

Highlights of Nortel's successes within the market include:

- CPL simplifies DWDM line systems to enable Capex or Opex savings and reduces the time to

deploy value-rich services.

- The platform provides the smallest initial and final footprint solution with low power consumption that delivers scalability and in-service capacity expansion from 2 to more than 72 wavelengths.
- Using the flexible architecture, wavelengths are delivered anywhere and anytime.

Technical Specifications

CPL system features

Wavelengths supported (1.25G, 2.5G, 10 G, and 40 G-ready):

- 36 (100 GHz), 72 (50 GHz), or any combination to deliver between 36 and 72 wavelengths (capable of 88 wavelengths and more)

Supported Service Layer Network Elements:

- Optical Metro 3500/5200, Optical Multiservice Edge 6500, Optical DWDM Terminal (DT)
- Optical Cross Connect DX/HDX/HDXc, multivendor support (any ITU-compliant optical signal)

Reach:

- From 5 km (3 mi) to more than 2000 km (1243 mi) depending on service network element connected to the CPL

Optical control:

- Auto wavelength discovery, Continuous

Dynamic System Optimization, Fault Isolation
Supported configurations:

- Point-to-point, Ring, Mesh (for example, service network element protection schemes)

OAMP management features

Communication ports:

- 10Base-T, RS-232/modem craft access, 10/100BaseT internal (private), external (COLAN), Ethernet wayside ports at every site

Element and Network Management:

- SNMP, TL1, Craft Interface, Optical Network Manager, Ethernet wayside channel (10/100BaseT clear channel)

Office alarms:

- Critical, major, minor, warning

External alarms:

- CO Telemetry Ports

Connectors

Terminal Facing Configurations:

- Any supported using flexible patch panel

Fiber plant facing connect:

- SC

Typical Power Consumption and Footprint per site (Common Photonic Layer equipment)

- Fulfilled Channel Access site (36 wavelengths) = 180 W (0.5 rack).
- Fulfilled Channel Access site (72 wavelengths) = 425 W (0.75 rack).
- Fulfilled Line Amplification site (72 wavelengths) = 120 W (0.25 rack).
- ROADM site (36 wavelengths – 100 percent add/drop access) = 350 W (1 rack).
- Other features: Fiber management OSMINE, and NEBS3/ETSI-compliant.

Ordering information

For further information, contact your local Nortel representative.

Nortel Optical Multiservice Edge Platforms

The Nortel Optical Multiservice Edge platforms combine and extend the advantages of Nortel market-leading next-generation SDH, SONET, and metropolitan DWDM platforms in a complementary manner. The Nortel Optical Multiservice Edge product can be deployed in SDH and SONET environments that support a broad mix of services. These solutions are ideal for enterprise organizations in education, government, finance, health care and manufacturing environments that need to reduce operating and equipment costs while maintaining a simple, scalable, resilient, and secure platform.

- Nortel Optical Multiservice Edge 1000 series
- Nortel Optical Multiservice Edge 6110
- Nortel Optical Multiservice Edge 6500

Nortel Optical Multiservice Edge 1000 Series

Overview

Nortel Optical Multiservice Edge 1000 (OME 1000) series of products are cost-optimized customer-premise solutions for fast and efficient deployment of Ethernet services. The OME 1000 series of products makes existing networks flexible, manageable, and easy to troubleshoot. The OME 1010, OME 1030, and OME 1060 consist of chassis that are sized at 1, 3, and 16 slots, respectively.

Ideal For

Service providers enjoy an evergreen service that can scale up to one Gigabit per second without changing hardware. The OME 1010, 1030, or 1060 low cost and small form factor allow success-based deployment (as individual customer premises come online), to reduce upfront cost, to increase profitability, and to improve time to revenue.

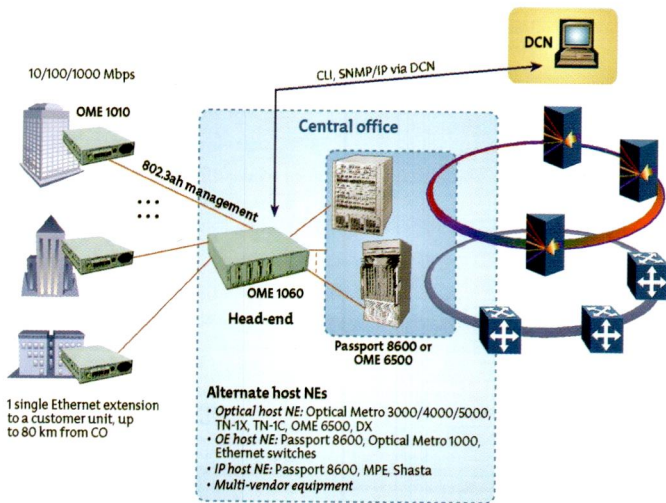
Business Challenges

- Do you need a more efficient method for transporting Ethernet services?
- Do you need full visibility and control of your Ethernet service offerings and would like to extend your Ethernet service demarcation to the customer premise?
- Do you need better management and troubleshooting tools for your Ethernet services?
- Are you worried about someone accessing your network from a customer access location?
- Do you need to minimize new IP addresses being added to your network?

Typical Applications

The OME 1010 is used in a point-to-point manner for Ethernet connectivity. Another Ethernet connection involves an OME 1060 that serves as a head-end shelf installed in the central office to extend Ethernet services from the service provider network to the customer premises and to extend these services through OME 1010s. The OME 1060 head-end shelf connects to an Optical, Optical Ethernet, or IP network depending on the host equipment. The OME 1010, 1030, or 1060 are used with CWDM filters to extend the optical network and to transport service in wavelength format across long distances and to provide fiber relief.

Network Diagram



Key Points

- Ethernet support: The two service modules supported on the OME 1010, 1030, and 1060 are the FX module and GE module. The FX modules support 10Mb/s and 100 Mb/s. The GE module supports 10, 100, and 1000 Mb/s.
- 802.3ah standardized Operations, Administration, and Maintenance (OAM) management: The OAM 802.3ah standard commands provide complete control of the remote CPE module.
- Simple and Rapid Installation: Easy plug installation lowers costs and reduces time to market.
- Reliability and Robustness:
 - Last Gasp alerts the network that it is losing power before shutting down
 - Fault detection and alarms for the client interface and a dedicated link
 - Visual indicator LEDs (red, yellow, and green) for power, Ethernet client interface and dedicated link
 - Periodic status reports for Ethernet services states

- Client and Network Port Performance Monitoring: Demarcation functions indicate performance of service at the edge of the network to provide improved service level agreements (SLAs).

Features and Benefits

The Optical Multiservice Edge 1010, 1030, and 1060 lower operational expenses by decreasing the time required to troubleshoot network issues and by providing quick recovery time while customer satisfaction increases.

Customer demarcation and simplified remote management: the OME 1010, 1030, and 1060 series support OAM features that bring visibility and ease of management to the edge of the network. Simple and efficient network management enables early fault detection and quick fault isolation.

Rapid time to revenue due to rapid deployments: OME 1010 can be deployed quickly and cost-effectively upon customer demand with minimal upfront cost. OME 1000 is a key enabler for booming Ethernet connectivity and its ease of management.

- service flexibility: changing bandwidth needs (10 Mb/s to 100 Mb/s to 1 Gb/s) are quickly and easily met.
- easy installation: OME 1010 is quick and easy to install with OAM configuration on the customer premises. Deployments are simplified through:
 - configuration without IP to free service providers from allocating precious IP addresses on their networks
 - autonegotiation and auto-in-service automatically run at start-up
 - loop-back testing enables a quick link continuity check at start-up
 - automatic discovery where OME 1000 identifies itself to its paired host upon installation

Flexibility

- application flexibility: Support for network demarcation of Layer 1, 2, and 3 applications by the same unit.
- packaging flexibility: OME 1010 is a desk- or wall-mountable compact device.
- bandwidth and service flexibility: Scalable from 10 to 100 Mb/s on the FS module, or from 10 to 1000 Mb/s on the Gigabit Ethernet (GE) module that provides forecast tolerance and scalable Ethernet extension. Allocate bandwidth in 1 M increments on the GE module or in 32 Kb/s increments on the FX module to meet the changing bandwidth needs.
- Reach and media flexibility: Small Form Factor Pluggables (SFP) are used to support different media type, reach, and services. SFPs include SR, ST, IR, SX, LX, XD, ZX, and CDWM to provide flexible optical access networking options.

Global and Cross Portfolio Product

- The OME 1010, 1030, and 1060 series is compatible with the Nortel SONET, SDH, and DWDM (Optical Metro 3000, 4000 and 5000, TN-1X, TN-1C, OME 6500) and Ethernet switching (Optical Metro 1000, Ethernet Services Unit 1800, and ERS 8600), MPE 9000, and Nortel Networks Wireless LAN portfolio. The OME 1010, 1030, and 1060 interconnects with any device that supports Ethernet, including multivendor equipment to enable an end-to-end network solution.

Market Information

- Number one optical networking vendor globally.
- Number one worldwide for metro DWDM.
- Number one worldwide for total DWDM.
- Number one in Ethernet over WDM
- First complete optical engineering certification program
- First commercial Optical Ethernet network
- First with 10 Gigabit Ethernet WAN
- First with Layer 2 Resilient Packet Rings and distributed MPLS VPNs
- Nortel developed GFP and worked with ITU for standardization.
- Chair CWDM ITU standardization committee and RPR alliance.
- In some regional locations Nortel provides a fiber-acquisition service for enterprise channel partners because locating fiber on which to build these solutions can be difficult.

Technical Specifications

	OME 1010	OME 1030	OME 1060
Description	1 service chassis, CPE	3 service chassis, CPE or CO head-end shelf	16 service chassis, CO head-end shelf
Dimensions	Height: 2.5 cm (1 in.) Width: 7.6 cm (3 in.) Depth: 17.9 cm (7 in.)	Height: 2.5 cm (1 in.) Width: 32.4 cm (12.75 in.) Depth: 17.9 cm (7 in.)	Height: 11.2 cm (4.4 in.) Width: 32.4 cm (12.75 in.) Depth: 44.3 cm (17.4 in.)
Weight	Min. 120 g (4.25 oz), Max. 240 g (8.47 oz)	Min. 300 g (10.5 oz) Max. 660 g (23.3 oz)	Min. 600 g (21.2 oz) Max. 2.52 kg (5.6 lb)
PEC	NTK951AC/AD	NTK951AB	BTK951AA
Standards	IEEE802.3ah compliant	IEEE802.3ah compliant	IEEE802.3ah compliant
Power supply	90-240V ac or -48V dc power supply (built-in)	90-240V ac or -48V dc power supply (removable)	90-240V ac or -48V dc power supply (removable)
Cooling unit	Not Required	Integrated fan units	Integrated fan units
Mounting options	Table mount or wall mount supported with bracket	Table-mount: 48.3 cm (19 in.) Rack-mount: 58.4 cm (23 in.) supported with bracket	Table-mount: 25.4 cm (10 in.) Rack-mount 58.4 cm (23 in.) supported with bracket
Optional redundant power supply	Not supported	Supported	Supported
Supported transponder cards	Any (only 1)	Any (1 to 3)	Any (1 to 16)

	OME 1010	OME 1030	OME 1060
Transponder modules supported	Fast Ethernet Module Primary line interface –100FX (SM, MM, IR) –SFP pluggable module Protection line interface –Optional (active if SFP equipped) –Physical layer protection –100 FX (SM,MM,IR) –SFP pluggable module Customer interface (default) –110/100BT –RJ-45 Optional client interface –Optional (active if SFP equipped) Gigabit Ethernet module Line/network interface: –1GW, SX, LX, ZX, CWDM –SFP pluggable module Protection line interface –Optional (active if SFP equipped) –Physical layer protection –GE SX, LX, ZX, SWDM –SFP pluggable module Customer interface (default): (10/100/GE electrical: –RJ-45 Optional client interface –Optional (active if SFP equipped) –GE SX, LX, ZX, 100FX CWDM Network management module –Remote configurable to monitor any service module or chassis –Network management locally through RS-232 Command Line Interface –Remote SNMP network management through CLI, or OME 1000 Configurator Tool –Manage up to 30 10/100/1000 modules –E-mail alert notification based on system events –Supports ping, module loop-back diagnostics, and module reset –Fits 3- and 16- slot chassis –LED status indicators for power, transmit/receive, and link		
Network management	Not required	Discretionary (NTK945AA)	Mandatory (NTK945AA)
Management	–Craft UI (The Configurator Tool) = CLI –Northbound SNMP		
Protection capability	–Line protection using an additional optical SFP		
Environmental	–Relative humidity: 85% maximum, non-condensing –Operation temperature: 0°C to 50°C –Storage temperature: –40°C to 95°C		

Nortel Optical Multiservice Edge 6110



Overview

Nortel Optical Multiservice Edge 6110 (OME 6110) is the first of a family of compact, low-cost multiservice access products optimized for deployment in customer sites and in collector networks where low service capacity is required. It offers new Ethernet services to the metro edge, as well as traditional TDM services over SONET and SDH networks. OME 6110 is an extension of the Nortel Optical Multiservice Edge 6500 that offers service flexibility at the customer location with a small, cost-effective footprint. The OME 6110 is integrated with the Nortel Optical Network Manager to form a complete end-to-end and fully managed solution. The OME 6110 is ideal for small offices and business parks that demand reliable quality of service and flexible bandwidth availability.

Ideal For

The OME 6110 provides low-cost, multiservice aggregation and transport of client services over SONET and SDH networks. The compact size and cost-effective attributes, including the ability to reliably deliver simultaneous data and voice services to customer premises, make the OME 6110 an ideal solution for business access applications.

Business Challenges

- Do you need to find a more cost effective access solution with low power consumption and smaller footprint?
- Do you need to transport both TDM and Ethernet services over your network?
- Do you need a cost effective Ethernet aggregation solution in the access part of your network?

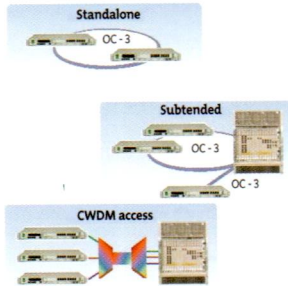
Typical Applications

The OME 6110 is ideal for small offices and business parks that demand reliable quality of service and flexible bandwidth availability. The product is equally well suited for deployment in access or collector networks in remote and suburban areas with low capacity requirements or as a transport component of wireless base stations.

The OME 6110 can be deployed in the following configurations:

- **stand-alone configuration:** The OME 6110 can operate on a standalone network collecting DS1/E1, DS3/E3, and/or Ethernet and dropping them off at remote sites on the network.
- **subtending configuration:** The OME 6110 can subtend from either the Optical Metro 3000, 4000, or the Optical Multiservice Edge 6500 shelves to collect DS1/E1, DS3/E3, and Ethernet traffic from the access edge to feed into the core of the network for further transportation.
- **CWDM access:** The OME 6110 combined with CWDM filters can send traffic on wavelengths to offer fiber relief and extended reach.

Network Diagram



Key Points

- Low-cost entry configuration for E1/DS1-only services
- In-service expansion for new services
- Cost-optimized and designed for CLE deployments
 - Minimal CPE rack space
 - No rectifiers required; built-in AC or DC power
 - Fits in 19-, 21-, and 23-inch racks
 - Front access cabling
- GFP, VCAT, and LCAS supported

Features and Benefits

The OME 6110 is a cost-effective, multiservice edge device that uniquely offers the following:

- **Evergreen service:** the OME 6110 supports legacy traffic and next-generation Ethernet on a single platform, to allow service providers to future-proof their SONET and SDH networks to accommodate an increasing demand for Ethernet services.
- **Flexibility**
 - **Service flexibility:** Full service mix including SONET, SDH, and Layer 1 and 2 Ethernet
 - **Reach flexibility:** The OME 6110 uses small form-factor pluggable (SFP) optics for networking interfaces. Configure and optimize each platform for the distance requirements of an application by inserting the appropriate SFP module.
 - **Protection flexibility:** deploy with or without protection, in a stand-alone,

subtended configuration or CWDM access model. Support exists for 1+1 and UPSR/ SNCP network protection protocols.

- **Interoperability flexibility:** the OME 6110 networks with other OME 6110s or deploys as extensions of other Nortel optical products. Specifically, the OME 6110 was successfully tested for interoperability with Optical Metro 3000, 4000, and the Optical Multiservice Edge family of products.
- **Management flexibility:** TL-1 plus SNMP northbound interfaces, Optical Network Manager, and an HTTP Web-based Craft user interface that runs directly on the network element. The PC requires no Craft software.
- **Data communication flexibility:** the OME 6110 can be managed over Open System Interconnection (OSI) or Internet Protocol (IP) DCC networks. For transparency across leased circuits, support exists for Path DCC.
- **Global support:** the OME 6110 supports SONET, SDH, and J-SHD on the same platform for in-territory and out-of-territory deployments.
- **Low total cost of ownership:** The OME 6110 provides a low total cost of ownership with low power consumption and built-in support for ac and dc power to remove the need for external rectifiers. Extensive fault monitoring and loop-back capabilities simplify troubleshooting and decrease operational expenses.

Market Information

- Number one optical networking vendor globally.
- Number one worldwide for metro DWDM.
- Number one worldwide for total DWDM.
- Number one in Ethernet over WDM.
- First complete optical engineering certification program.
- First commercial Optical Ethernet network.
- First with 10 Gigabit Ethernet WAN.
- First with Layer 2 Resilient Packet Rings and distributed MPLS VPNs.
- Nortel developed GFP and worked with ITU for standardization.
- Chair CWDM ITU standardization committee and RPR alliance.
- In some regional locations Nortel provides a fiber-acquisition service for enterprise channel partners because locating fiber on which to build these solutions can be difficult.

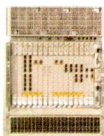
Technical Specifications

Description	Multi-service chassis, customer-located equipment
Dimensions	Height (1RU): 4.4 cm (1.8 in.) Width: 44.5 cm (17.5 in.) Depth: 27.0 cm (10.6 in.)
Weight	Fully equipped: 5.1 kg (11.2 lb)
Standards	Safety EN 60950 • EMC GR-1089 CORE, EN55022 • Other compliances: ITU-T K.11, K.20, K.21, FCC68
Power	• ac power supply: 90V-240V 50/60Hz • dc power supply: 40-56V dc • Maximum power consumption: 30W (depending on service modules used)
Cooling Unit	• Dimensions: 20.4 cm x 3.2 cm x 2.0 cm (8.3 in. x 22.5 in. x .8 in.) • Flow: 0.08 cu. m/min. (0.10 cu. yd/min.) • Inbuilt dust filter • Hot-pluggable
Mounting Options	• 19 in., ETSI and 23 in. rack-mountable
Client Interface Modules Supported	The OME 6110 comes with a built-in support of 16 DS1/E1 in the base chassis. In the Optional Service Slot, it can support the following cards: • 28 x E1/DS1 • 8 x 10/100-Mbp/s Ethernet • 3 x E3/DS3 • 1 x STM-10/OC-3 • Gigabit Ethernet (future)
Network Interface	• STM-1/OC-3 network uplink • STM-4/OC-12 (future)
Architecture	• Non-blocking TDM fabric capable of aggregating VC-12/VT-1.5, STS/VC-3, and VC-4 mapped services to an OC-3 or STM-1 line interface
Management	• Ethernet LAN Interface or modem • TL-1 and SNMP northbound interfaces • Web-based Craft UI • Integrated Nortel Networks Optical Network Manager
OAM Interfaces	• LAN port to a data communications network (DCN) • RS-232/F1 port for modem access or for user byte access
Environmental Alarms	• Four telemetry outputs • Seven telemetry inputs

Ordering Information

For further information, contact your local Nortel representative.

Nortel Optical Multiservice Edge 6500



Overview

The Nortel Optical Multiservice Edge 6500 (OME 6500) is a next-generation optical convergence platform that converges multiple services and network layers onto a single platform for more cost-effective support of broadband services. Users can transform their deployed SONET/SDH networks to a high-speed packet optical solution through a smooth and scalable evolution path. Simplification of both the network and its management results in the delivery of multiple services while simultaneously achieving significant capital and operational cost savings.

Ideal For

The OME 6500 suits medium to large enterprise sites with mission-critical applications or services that are best transported over a next-generation SONET or SDH network, including:

- Optical Ethernet transport and switching to meet the increasing bandwidth (large number of GigE or 10 GigE or E3/DS3, etc) and QoS performance needs of enterprise organizations deploying CRM, IP telephony, collaborative applications, Web-based applications, and IP-video solutions.
- Site interconnect or LAN extension services needed to support network or server consolidation goals.
- High-speed Internet access for enterprise data centers to support customer contact and employee mobility.
- Digital information services such as X-rays, MRIs, ultrasound graphs, video and media production, intellectual property, financial data, and customer information.
- Large-scale grid computing for applications such as climate, genomic, geophysical and astrophysics research, and engineering and design.
- Enterprise data centers with increasing needs for performance, resiliency, and scalability.

Business Challenges

- Do you need to achieve dramatic savings and simplify your network through successful optical convergence of Layer 0, 1, and 2 services?
- Is your business demanding increasing bandwidth and performance? Do you need to transport a large number of Gigabit Ethernet or 10 Gigabit Ethernet securely and cost-effectively?

- Can your network support the QoS and scalability required for new applications and services?
- Do you need to address specific networking requirements?
- Do you want to reduce the cost and complexity of your metro network?
- Is your Internet connectivity meeting your requirements for scalability, flexibility, and resiliency?
- Are your insurance premiums for "business disruption" policies increasing?

Typical Applications

- Efficient transport of both TDM and Ethernet services.
- Full-rate and sub-rate Ethernet, Gigabit Ethernet, and 10 Gigabit Ethernet over SONET/SDH to extend reach between enterprise sites to thousands of miles.
- Layer 2 Service Switch (L2SS) capabilities help aggregate and switch Ethernet services to provide strong services and infrastructure solution for IP, Ethernet Private LANs, Ethernet VPLs, Ethernet Virtual Private Lines, Triple Play Services, and Internet access solutions.
- Transport of broadband interfaces for bandwidth-hungry applications
- Resilient Packet Ring (RPR) support enabling bandwidth sharing, high reliability, and network simplicity for private LAN applications and an efficient Ethernet switched backhaul for Ethernet VPN and IP traffic.
- **Education:** school districts, colleges, universities—converged voice, data and video network to deliver next-generation education applications.
- **Government:** local, state and federal

institutions—links government, business and citizens

- **Finance:** financial service, banks, insurance companies—secure transport of mission-critical financial data.
- **Health care:** HMOs, hospital systems, health services—distribution and storage of medical imaging and records.
- **Manufacturing:** high tech, automotive, publishing—scalable networks that enable collaborative file sharing and e-commerce.

Key Points

- **Simple:** lowers the total cost of ownership by removing bandwidth bottlenecks and providing efficient support for existing and new enterprise applications and services.
 - a flexible network architecture suitable for core and enterprise networks
 - convergence of transponding, TDM, and Ethernet transport and switching functionality on a single platform
 - standards-based packet adaptation to SONET, SDH through generic framing procedure (GFP), virtual concatenation (VCAT), and link capacity adjustment scheme (LCAS) to efficiently transport and manage high-speed data connectivity
 - compatible with all common optical data communication protocols
 - remote network management
- **Scalable:** up to 48 GigE or 192 protected DS3s per single shelf in a bay
 - high-density data, optical, and electrical interfaces that can be combined for industry leading cost-efficient mixed-service applications
 - multiservice support: DS1/E1, DS3/E3, Transmux, EC-1/STS-1, OC-3, OC-12, OC-48, OC-192, Ethernet (10/100 Base-T, 100 Base-FX and 1000 Base-SX/LX), storage interfaces (FICON and fiber channel with distance extension) and transparent wavelengths services using transponders
- **Resilient** – carrier-grade, 99.999 percent availability is a key requirement

- less than 50 milliseconds cut-over time to an alternative network path

- in-service upgrades to hardware and software

- **Secure** - Supports security features that block intrusion attempts and hacking tools
 - Enables centralized user access management through RADIUS servers
 - supports a challenge and response mechanism that addresses many security issues associated with sending authentication information over unsecured links

Features and Benefits

The Nortel Optical Multiservice Edge simplifies networks to reduce solution deployment costs. The industry-leading service interface densities, pioneering 80-Gb/s, unconstrained, single-stage VT-1.5/VC-12 switching, integrated Layer 2 (packet) switching, and a wide range of carrier-grade, pluggable optics modules with selectable bit-rate, wavelength and reach make platform configurations possible that effectively align with actual enterprise demand and improve shelf capacity use.

As an evolution of market-proven Nortel optical technology, the Nortel Optical Multiservice Edge 6500 delivers a compact and versatile solution that sets new economic benchmarks for deploying broadband connectivity with the highest level of scalability, flexibility, reliability and security.

- reduced equipment and operating costs
- efficient broadband connectivity for bandwidth-hungry enterprise applications
- multiservice diversity and high interface density to enable low total cost of ownership
- versatile optical interface reach, rate, and wavelength deployment

Market Information

- Number one optical networking vendor globally
- Number one worldwide for metro DWDM
- Number one worldwide for total DWDM
- Number one in Ethernet over WDM
- First complete optical engineering certification program

- First commercial Optical Ethernet network
- First with 10 Gigabit Ethernet WAN
- First with Layer 2 Resilient Packet Rings and distributed MPLS VPNs
- Nortel developed GFP and worked with ITU for standardization
- Chair CWDM ITU standardization committee and RPR alliance
- In some regional locations Nortel provides a fiber-acquisition service for enterprise channel partners because locating fiber on which to build these solutions can be difficult

Technical Specifications

Performance	
Total Backplane Capacity	160 Gb/s plus bandwidth for transparency or slot
Add/Drop	Full Connectivity (add or drop)
Transmux	Available
Cross-connection (Fabric size and granularity/Number of STS-1/VT1.5 or VC-3/VC-12)	Five matrices: 160G STS-1; 80G STS-1; 80G STS-1 / 80G VT1.5; 80G STS-1 / 20G VT1.5; 20G STS-1/ 20G VT1.5
TSA/TSI	Full TSI, TSA, Drop-and-Continue, Hairpinning
Data Support	Integrated packet fabric, RPR
Virtual Concatenation, GFP, LCAS support	VCAT, GFP, LCAS supported
Tributary Interfaces	
OC-192 Ports/Chassis	14 OC-192 ports/chassis
OC-48 Ports/Chassis	48 OC-48 ports/chassis
OC-12 Ports/Chassis	96 selectable OC-3/12 ports/chassis
OC-3Ports/Chassis	96 selectable OC-3/12 ports/chassis
DS3/E3 Ports/Chassis	96 E3 ports/chassis; 192 DS3/STS-1 ports/chassis
10 GigE Ports/Chassis	14 x 10 GigE ports/chassis
1 GigE Ports/Chassis	48 GigE ports/chassis
10/100Base-T Ports/Chassis	192 10/100Base-T ports/chassis
100Base-FX	96 ports/chassis
Architecture	
Shelf Layout	8 slots with 10Gbp/s + 4 slots with 20Gbp/s - each slot can be trib/line/transponder
Shelf Layout	8 slots with 10Gb/s 6 slots with 20Gb/s Note: each slot can be trib, line, or transponder
Service Interface Slots	All slots can operate as trib or line slots

Performance	
Mapping Structure	SONET, SDH, GFP, HDLC, transparent mapping
Laser source/type (LR/IR/SR)	SR1/I64.1, IR2/S64.2, LR2/L64.2, SFP, and DPO (DWDM pluggable optics)
DWM Wavelengths Supported	32 wavelengths compatible with OM5200 (16 C-band, 16 L-band); 36 wavelengths in C-band compatible with CPL
Amplification	OM5000 and CPL amplification supported
Equipment Redundancy	Fully redundant, no single point of failure
Clock Source/Timing	Internal, external, SONET / SDH and Japan timing sources
Features	
Network Mgmt	TL-1, SNMP; GUI: Optical Network Manager
Craft Interface	TL-1 and SNMP; GUI: Optical Network Manager
Test Access	multiple bit rate with intrusive and non-intrusive modes
OSS/BSS Interface	TL-1 and SNMP
Protection	1+1, UPSR, BLSR, RPR
In-service Upgrades	Remote in-service software upgrade, in-service switch matrix upgrades
ITU Standards Supported	ITU standards supported for 7 Layer OSI; GFP standards, G7041, G707/783, G.7042, 802.17 for RPR
Physical Specifications	
Chassis for max. configuration	four shelves per 2.13 m (7 ft) bay
Chassis Dimensions	Height: 57.7 cm (22.7 in.) 93.3 cm (36.7 in.) with I/O extension Width: 43.9 cm (17.3 in.) Depth: 27.9 cm (11.0 in.)
Hot Swappable Cards	All cards are hot swappable
NEBS/ETSI Compliance	NEBS/ETSI full compliancy
ANSI/ETSI Conformance	OME 6500 is a global platform (SONET and SDH); compliant with both ANSI and ETSI
Power Requirements	-40V to -75V dc
Operating Temperature	5°C to 40°C (41°F to 104°F)
Operating Humidity	5% to 85% RH
Mounting Options	48.3 cm (19 in.) and 58.4 cm (23 in.)

Ordering Information

For further information, contact your local Nortel representative.

Nortel Carrier Ethernet

Nortel has one of the broadest Ethernet portfolios in the industry. We build on our knowledge and experience with service providers as well as enterprises to deliver solutions optimized for a wide range of applications. Our Carrier Ethernet Solutions (Metro Ethernet Services Unit 1800/1850, Optical Metro 1000, and Metro Ethernet Routing Switch 8600 families) comprise a suite of switched Ethernet platforms that fulfill varying roles in the network ranging from access to aggregation to core and long-haul functions.

Ethernet is transforming customer networks by enabling high-bandwidth applications and simplifying network design through the convergence of voice, video, and data over a packet-oriented infrastructure. Service providers and large enterprises now support a variety of Ethernet connectivity services such as Ethernet Private Line and Ethernet VPNs that serve as the foundation for enabled services including Internet access, transparent LANs, and numerous voice and video applications.

The Nortel Ethernet portfolio includes the following products:

- Nortel Metro Ethernet Routing Switch 8600
- Nortel Optical Metro 1000 Series (1200, 1400, and 1450)
- Nortel Metro Ethernet Services Unit 1800/1850

For details about Nortel Ethernet solutions not covered in this section, see the Table of Contents for this Guide.

Nortel Metro Ethernet Routing Switch 8600



Overview

The Nortel Metro Ethernet Routing Switch 8600 is a carrier-grade, purpose-built version of the popular Nortel Ethernet Routing Switch 8600 (see Ethernet Routing Switch Portfolio in this Guide for details). It is a key component of Nortel's Carrier Ethernet solution, delivering 1-Gigabit and 10-Gigabit Ethernet performance with Quality of Service (QoS) for business-critical applications and services. The Metro Ethernet Routing Switch 8600 delivers premium performance and availability, QoS-based traffic prioritization, scalability, and support for a wide range of interfaces.

Ideal For

The Nortel Metro Ethernet Routing Switch is ideal for:

- Incumbent and new service providers, seeking to extend their service offerings to include differentiated Ethernet services (for example, gold, service, and bronze) and to capitalize on optical or data-centric installed bases.
- Incumbent and new service providers who want to deploy a cost-effective, manageable, and deterministic infrastructure for triple-play and video distribution services or all types.
- Enterprise customers, such as city networks, airports, railway and highway operators, and utility companies who want to build a network for internal use or who plan to offer services from the infrastructure they build.

Business Challenges

The business challenges to consider when deciding to purchase a Nortel Metro Ethernet Routing Switch are:

- Do you want to deliver Ethernet services with high-QoS to enterprises and residential deployments alike?
- Are your traditional ATM/FR services coming under pricing pressure from competitive IP-based offers?
- Do you struggle to keep pace with the operational and management demands of traditional TDM networks in support of data-centric applications?
- Is traditional Ethernet struggling to scale beyond 4096 VLANs in the face of exploding user and service demand across multiple metros?

- Do you want an aggregation or core switch that is easy to install and use?
- Do your customers have multiple, distant offices (up to 70 km) that need to share resources?
- Do you expect your business and the associated traffic in your network to grow within the next 6 to 18 months?
- Do you want a secure and scalable separation of customer traffic?
- Do you want to create simple any-to-any connectivity?

Typical Applications

The Metro Ethernet Routing Switch 8600 is the Ethernet workhorse of Nortel's Carrier Ethernet and Optical Networking portfolios. Together, the portfolio is intended for carriers and large enterprises wanting to cost-effectively deploy infrastructure to support residential triple-play services, wireless backhaul services, data-center interconnection, or business VPN services. In fact, the key advantage of the Nortel solution is the ability to deliver on all of these key applications using a common, converged infrastructure.

With a range of fault-tolerant models to choose from, the Metro Ethernet Routing Switch 8600 offers cost-effective Ethernet switching solutions with superior flexibility for enterprises and service providers. Three redundant chassis models are available:

- For service provider central offices, Nortel offers a NEBS3-compliant 10-slot chassis designed for the most demanding environments with enhanced cooling and electromagnetic interference (EMI) protection features.

- Where high density, availability, and scalability are essential, Nortel offers a 10-slot chassis—one or two slots for a load-sharing CPU and switching fabric module, with the remaining slots available for input and output modules.
- Where space is at a premium and low density is desired, a six-slot chassis is available.

Key Points

The industry leading Nortel User Network Interface (UNI) is offered across the portfolio and based on 802.1ah (Mac-in-Mac) technology.

- secure customer delineation so multiple (often thousands) of users can rest assured that their data will be securely delivered to the desired destination
- scalability and efficiency of Ethernet and optical technologies with support for millions of service instances at the price points of Ethernet
- quality of service that guarantees the service-level experience to which each individual customer agrees
- service management that facilitates the day-to-day operation of a wide-ranging network by providing simple point-and-click provisioning, real-time alarm-driven fault management, and high-quality performance reporting
- resilience that provides SONET/SDH-comparable restoration if a link or network node fails
- Provider Backbone Transport technology enables the creation of deterministic, end-to-end tunnels through the network that provide traffic

engineering and OAM functions at the cost-point of Ethernet

- the Metro Ethernet Routing Switch 8600 offers a variety of access options to meet service demands and a range of transport alternatives to make use of existing infrastructure
- simple endpoint provisioning for fast service uptime and low cost of implementation
- QoS features to enable tiered services and profitable SLAs

Features and Benefits

The Nortel Metro Ethernet Routing Switch 8600 provides a cost-effective means for service providers to offer Ethernet services using a carrier-class, chassis-based platform. The industry-leading Ethernet UNI, based on Provider Backbone Bridging technology (802.1ah), ensures scalable and secure customer separation, provides robust QoS and bandwidth policing features, and enables service providers to establish a line of demarcation and a point at which to collect statistics to meet service level agreements. Provider Backbone Trunking adds the ability to engineer deterministic paths through a network to avoid congestion and increasing reliability on an end-to-end basis.

Technical Specifications

Capacity and performance	• Full-duplex switching capacity of 512 Gb/s, with redundant switch fabrics • Performance for 64-byte packets: aggregate throughput maximum of 384 Mp/s, 10-microsecond latency
Chassis options	• 8006, 6-slot chassis for backbones of low density or high space premium; • 8010, 10-slot chassis for high availability and high scalability; • 8010CO, 10-slot NEBS-compliant chassis.
Switch Fabric/CPU modules	One switch fabric required; a second optional fabric doubles capacity and provides load sharing • 8691 omSF Switch Fabric and CPU Module • 8600 CPU Expansion Mezzanine card for 8691omSF, Field installable, Supports 50ms failover • 8692omSF Switch Fabric and CPU, One required with 8630GBR and 8683XLR modules, Interoperable with all pre-R modules • 8692omSF Switch Fabric and CPU 8692 with Expansion Mezzanine card, Supports 50 ms failover on NNI trunks with MultiLink Trunking
Interface modules	• 8668ESM, 8-port Ethernet Services Module, SFP-based, Gigabit Ethernet • 8630 GBR, 30 ports 1000 BaseX for SFP • 8683 XLR, 3 ports 10 Gigabit Ethernet XFP (LAN PHY only) • 8632TXM, 32 ports 10/100 plus 2 GBIC ports • 8648TXM, 48 10/100TX ports • 8608GBM, 8-port Gigabit Ethernet, GBIC-based • 8683POSM, POS Baseboard supports up to 6 OC-3 or 3 OC-12 ports • 8608GTM, 8 ports 1000BASE-T, fixed Gigabit Ethernet

Nortel Optical Metro 1000 Series

Overview

The Nortel Optical Metro 1000 series (1200/1400/1450) simplifies the delivery of Ethernet services. Defining a new class of optical Ethernet edge device, the Nortel Optical Metro 1000 Series serves as the customer demarcation point and entry ramp onto the service provider's network. As such, the Nortel Optical Metro 1000 Series offers the first consistent Ethernet user-to-network (UNI) interface in the industry, delivering cost-effective, secure and scalable separation of customer traffic. In addition, the Nortel Optical Metro 1000 supports simple end point provisioning to significantly simplify the provisioning of additions or changes to the network and driving fast time-to-revenue and customer satisfaction.

Ideal For

The Nortel Optical Metro 1000 series is ideal for:

- Incumbent and new service providers, seeking to extend their networks to the customer premises and to cost-effectively deliver differentiated Ethernet-based services to multiple customers.
- Enterprise customers, such as city networks, airports, railway and highway operators, and utility companies who want to build a network for internal use, or who plan to offer services from the infrastructure they build.

Business Challenges

Consider the Nortel Optical Metro 1000 series if you face the following business challenges:

- Do your users experience slow application response times?
- Do you have power users who require Gb/s bandwidth to the desktop?
- Do your real-time services suffer from excessive network latency?
- Do you want an aggregation or core switch that is easy to install and use?
- Do you want to aggregate Ethernet services onto existing optical or RPR nodes?
- Do your customers have multiple, distant offices (up to 70 km) that need to share resources?
- Are you concerned about cost when considering switching purchase?
- Do you expect your business and the associated traffic in your network to grow within the next 6 to 18 months?
- Do you want secure and scalable separation of customer traffic?
- Do you want to create simple any-to-any connectivity?

1200



1400



1450



Typical Applications

Optical Ethernet 1000 can be located in the customer's premises—whether that is an enterprise or multitenant/multidwelling units (MTU/MDUs)—or at the service provider's point-of-presence. The Optical Ethernet can be deployed to support an array of service-delivery scenarios, including point-to-point, point-to-multipoint, and any-to-any network configurations. The ability to provide secure separation of customer traffic, to scale to meet growing customer demand, and to maintain customer priorities enable the delivery of profitable, differentiated services.

Optical Ethernet 1000 is typically connected to Nortel Ethernet Routing Switch 8600 high-performance gigabit Ethernet switches, or the Nortel Optical Multiservice Edge family, which together make up a metro Ethernet aggregation network. These metro Ethernet networks in turn can be interconnected by either ATM, IP/MPLS, or native Ethernet regional and long-haul networks.

Key Points

The key points of the Nortel Optical Metro 1000 include:

- The Nortel Optical Metro 1000 serves as the Layer 2 VPN demarcation point in the service provider network to offer an innovative and industry-first, consistent Ethernet user-to-network interface (UNI) that enables:
 - increased scalability of services
 - quicker provisioning of services
 - lower operational costs
 - secure separation of multiple customers' traffic
- Cost-effective and scalable delivery point for

Ethernet services in the MDU/MTU, enterprise, and point-of-presence.

- Varying access options to meet service demands and range of transport alternatives to build on existing infrastructure.
- Secure and scalable separation of customer traffic with transparent and mapped VLAN support.
- Simple end-point provisioning for fast service uptime and low cost of implementation.
- QoS features to enable tiered services and profitable SLAs.

Features and Benefits

The Nortel Optical Metro 1000 provides a cost-effective way for service providers to offer an array of Ethernet-based services. The industry-leading Ethernet UNI ensures scalable and secure customer separation, provides robust QoS and bandwidth policing features, and enables service providers to establish a line of demarcation and a point at which to collect statistics to meet service-level agreements.

The Nortel Optical Metro 1000 consists of three platforms to meet a variety of Ethernet service delivery scenarios, such as multitenant service delivery providing Ethernet services on tenant floors, single unit and enterprise service delivery, or delivery of services from a service provider point of presence. Together, these platforms provide:

- **Carrier-class NEBS level 3 compliance** to meet the most rigorous electrical, environmental, temperature and vibration standards for reliability.
- **Dual gigabit Ethernet uplink ports** using provisionable multilink trunking (MLT) and sharing the load between the two Gigabit Ethernet ports enables increased bandwidth and ensures availability of service with subsecond failover.
- **Varying access or UNI options** to meet service demands and transport alternatives (10/100 Mb/s, 100 Mb/s, Gigabit Ethernet, copper, fiber).
- **Two Gigabit Ethernet uplink options**, including one or two 1000Base-TX uplink ports or a dual-port, small form factor pluggable (SFP) gigabit interface connector (GBIC), ensures cost-effective transport over fiber, RPR, and DWDM.
- **Services for up to 500 customers per device** by using a transparent domain identifier (TDI) or a VPN identifier (VPN-ID) for each customer.
- **Quality of service (QoS) and service level agreement (SLA) support** through tunable bandwidth from 1 Mb/s to 100 Mbps in increments of 1 Mb/s per port, or per TDI/VPN-ID, 802.1p and DSCP priorities mapping.
- **Cost-effective and scalable entry and delivery point for Ethernet services in the multitenant/ multidwelling units (MxUs), enterprise and service provider point-of-presence** by which service providers can scale their service offerings to meet customer demand by provisioning a new UNI port on a customer port, as compared with adding new equipment.
- **Various access options to meet service demands and range of transport alternatives to make use of existing infrastructure:**
 - 10/100 Mb/s, 100 Mb/s, Gigabit Ethernet services: copper and fiber
 - two Gigabit Ethernet uplink options: one or two 1000 Base-TX uplink ports or a dual-port, small form factor pluggable (SFP) gigabit interface connector (GBIC) to ensure cost-effective transport over fiber, RPR, and DWDM
- **Flexible service connectivity** supports point-to-point, point-to-multipoint, any-to-any and ring network topologies. Using a daisy chain technique, several Nortel Optical Metro 1000s can form an access ring and terminate into a Nortel Ethernet Routing Switch 8600 switch to create a logical ring. The access ring feature increases the user-to-network (UNI) port density and reduces fiber uplinks connected to aggregation devices, which lowers CAPEX. This feature also offers full hardware redundancy, easy scalability, and provides reliable discovery mechanism, thereby lowering OPEX. For each access

ring, support exists for up to 14 OM1000 units. In addition, various OM1000 platforms can combine into the access ring topology.

- **Secure and scalable separation of customer traffic—transparent and mapped VLAN support:**

- supports up to 500 transparent domain identifiers (TDI) or VPN identifiers (VPN-ID) for customer separation on each Nortel Optical Metro 1000 device.
- unique and industry-leading approach to defining an Ethernet UNI that is consistent across the Nortel Carrier Ethernet and Optical Networks portfolios.

- **Simple end-point provisioning supports fast service uptime and low costs to implement.**

The Nortel Optical Metro 1000 is provisioned with the relevant service SLA metrics and TDI/VPN ID information. Using the autodiscovery feature, the Optical Metro 1000 automatically learns of other sites in the customer network to avoid the need to provision existing network devices. When adding or deleting a new site to an existing customer network, the service provider needs to provision only the site to enable simple end-point provisioning.

- **Rate limiting and QoS features to enable tiered services and profitable SLAs:**

- effective use of bandwidth is achieved by tuning bandwidth from 1 Mb/s to 1000 Mb/s in increments of 1 Mb/s per port, per TDI/VPN.
- to avoid congestion and to manage traffic effectively, the Nortel Optical Metro 1000 has four egress queues per UNI port and eight egress queues per uplink port. Queue selection is based on a service provider 802.1p mapping to allow the network administrator to ensure the variety of customer traffic receives the appropriate priority.

- **Availability assurance with the VPN continuity tool,** which is a powerful tool to control the availability of service, to collect measurements for validation of the SLA, and to debug problems. VPN continuity is also integrated into Nortel service provisioning and supported across the Nortel Optical Networks portfolio.

Market Information

Successfully delivering services to the enterprise customer requires maximum availability, appropriate performance, and the ability to cost-effectively support new customers as demand increases. To ensure resiliency of services and optimal performance, the Nortel purpose-built Ethernet Service Modules provide:

- varying access or UNI options to meet service demands and transport alternatives (10/100 Mb/s, 100 Mb/s, Gigabit Ethernet, copper, fiber)
- support for up to 500 VPN Identifiers (VPN-IDs) for customer separation per Optical Metro 1000 device and the ability to provide multiple services per customer per port
- two Gigabit Ethernet uplink options including one or two 1000BASE-TX uplink ports or a dual-port, small form factor pluggable (SFP) Gigabit Interface Connectors (GBICs) to ensure cost-effective transport over fiber, SONET/ SDH, and WDM. These Gigabit Ethernet ports use provisionable multi-link trunking (MLT) load sharing between the two ports to ensure availability of service with subsecond failover
- effective use of bandwidth through features such as bandwidth tuning from 1 Mb/s to line rate in increments of 1 Mb/s per port per VPN-ID, and a mapped NNI feature that uses a VLAN tag within the service provider Ethernet encapsulation header to enhance security or direct traffic within the service provider network
- carrier-class NEBS Level 3 compliance meeting the most rigorous electrical, environmental, temperature, and vibration standards for reliability

Key industry firsts include:

- Consistent Ethernet UNI to provide secure customer separation, support differentiated services and SLAs, and relieve scaling limitations and end-user addressing complexity.
- Simple End Point Provisioning build on an autodiscovery capability and Preside Service Provisioning speeds service activation and low operational costs.
- VPN Continuity Tool provides service assurance and performance statistics between any two endpoints that are captured by the management and billing systems to substantiate SLAs.

Technical Specifications

	Nortel Optical Metro 1200	Nortel Optical Metro 1400	Nortel Optical Metro 1450
			
Role	• In-building aggregation supports up to 100 Mb/s	• Adds Gigabit Ethernet customer connectivity	• Aggregation in a point-of-presence
Service (customer) ports	• 12 10/100 Base-T ports	• 12 10/100 Base-T ports • 2-port SFP	• 12 100 Base-FX (single-mode fiber GBIC slots ports—a media converter can be used to connect 10/100 Base-T ports to the 100 Base-FX SMF ports • 2-port SFP GBIC slots
Network ports	• 2-port SFP GBIC slots • 1- or 2-port 1000 Base-T	• 2-port SFP GBIC slots • 1- or 2-port 1000 Base-T	• 2-port SFP GBIC slots • 1- or 2-port 1000 Base-T
Performance	Frame Forward Rate (64-byte packets) Up to 2.2 million packets per second (pps) maximum Port Forwarding/Filtering Performance (64-byte packets) For 10 Mb/s 14 880 pps maximum For 100 Mb/s 148 810 pps maximum For 1000 Mb/s 1 488 100 pps maximum Addressing 24 000 MAC addresses		
Data rate	Optical Metro 1200 ESM • For 10/100 Base-T Mb/s front-panel UNI ports 10 Mb/s Manchester encoded or 100 Mb/s 4B/5B encoded	Optical Metro 1400 ESM • For 10/100 Base-T Mb/s front-panel UNI ports 10 Mb/s Manchester encoded or 100 Mb/s 4B/5B encoded • For 1000 Mb/s front-panel UNI ports 1000 Mb/s 8B/10B encoded	• For 100 Base-FX front-panel UNI ports 10 Mb/s Manchester encoded or 100 Mb/s 4B/5B encoded • For 1000 Mb/s front-panel UNI ports 1000 Mb/s 8B/10B encoded
Reliability	• Carrier-class NEBS Level 3 compliant • Dual Gigabit Ethernet uplink ports utilizing provisionable Multilink trunking (MLT)		
Interfaces	Access • 12-port 10/100 Base-T autospeed sensing (support for up to 100 meters) • 12-port 100 Base-FX (SMF) (support for up to 15 km) • 2-port SFP GBIC slots using: – 1 port 1000 Base-SX SFP GBIC (mini-GBIC connector types: LC, MT-RJ) (2 km) – 1 port 1000 Base-LX SFP GBIC (mini-GBIC connector type: LC) (5 km) – 1 port 1000 Base CWDM SFP GBIC (mini-GBIC, connector type: LC; 1470 nm~1610 nm, 40 km or 70 km) Uplink options • 1 1000 Base-Tx port (RJ-45 connector) (100 meters) • 2 1000 Base-Tx ports (RJ-45 connector) (100 meters) • 2-port SFP GBIC slots using: – 1 port 1000 Base-SX SFP GBIC (mini-GBIC connector types: LC, MT-RJ) (2 km) – 1 port 1000 Base-LX SFP GBIC (mini-GBIC connector type: LC) (5 km) – 1 port 1000 Base CWDM SFP GBIC (mini-GBIC, connector type: LC; 1470 nm~1610 nm, 40 km or 70 km)		

Network protocols and standards compatibility	• IEEE 802.3 (Ethernet) • IEEE 802.1p (Prioritizing) • IEEE 802.3u (Autonegotiating) • IEEE 802.1Q (VLAN tagging)		
Physical dimensions	Weight: 4.8 kg (10.60 lb) Height: 7.0 cm (2.76 in.) Width: 43.8 cm (17.25 in.) Depth: 38.4 cm (15.1 in.)		
Electrical specifications	Input Voltage 100 to 240 V ac at 47 to 63 Hz Input power consumption: 70 W Input current: 0.75 A at 100 V ac; 0.4 A at 240 V ac Maximum thermal output: 240 BTU/hr	Input Voltage 100 to 240 V ac at 47 to 63 Hz Input power consumption: 60 W Input current: 60 A at 100 V ac; 0.3 A at 240 V ac Maximum thermal output: 215 BTU/hr	Input Voltage 100 to 240 V ac at 47 to 63 Hz Input power consumption: 65 W Input current: 65 A at 100 V ac; 0.35 A at 240 V ac Maximum thermal output: 230 BTU/hr
Environmental specifications	Operating temperature: 0° to 40 °C (32° to 104 °F) Storage temperature: —25° to 70 °C (—13° to 158 °F) Operating humidity: 85% maximum relative humidity, non-condensing Storage humidity: 95% maximum relative humidity Operating altitude: Up to 3024 m (10 000 ft) Storage altitude: Up to 12 096 m (40 000 ft)		
Safety agency approvals	• UL Listed (UL1950) • IEC 950/EN60950 • C22.2 No. 950 (CUL) with all national deviations • UL-94-V1 Flamability requirements for PC board • NOM (NOM-019)		
Electromagnetic emissions summary	Meets the following standards: • U.S.: CFR47, Part 15 Subpart B, Class A • Canada: ICES-003, Issue 2, Class A • Australia/New Zealand: NZS 3548:1995, Class A • Japan: V-3/97.04:1997, Class A • Taiwan: CNS 13438, Class A • Europe: EN 55022-1998/A1: 2000 Class A • EMC Directive: Directly published in the EMC Directive of 89/336/EEC with Modification 92/31/EEC, 93/13/EC – EN 61000-3-2: 2000 – EN 61000-3-3: 1995/A1: 2001 • Global: CISPR 22-1997/A1: 2000 Class A		
Electromagnetic immunity	• Global: CISPR 24:1997/A1: 2001 • Europe: EN55024: 1998/A1: 2001		

Ordering Information

For further information, contact your local Nortel representative.

Nortel Metro Ethernet Services Unit 1800/1850



Overview

The Nortel Ethernet Services Unit 1800 and 1850 are the delivery points for Ethernet services at the edge of the service provider network. These platforms effectively support Internet access, video transport, virtual private LAN service, and other applications for multiple customers on a single physical port. The unit can be deployed in either a ring-based or point-to-point topology in the metro access network. The unit delivers tunable bandwidth from 64 Kb/s to 1 Gb/s in granular increments. Packet classification, QoS, and SLA management tools allow providers to offer tiered services to customers.

The Ethernet Services Units work with the Metro Ethernet Routing Switch 8600 to provide 50-millisecond restoration time with the highest levels of scalability as well as the ability to map individual customer VLANs to separate customer VPNs. The Metro Ethernet Routing Switch 8600 provides the key User/Network Interface (UNI) functions such as end-to-end management and performance monitoring while the Metro Ethernet Services Units themselves offer a cost-effective and flexible set of service port functions.

Ideal For

The Nortel Metro Ethernet Services units are ideal for the following:

- high-density, highly populated areas, such as large cities and business parks
- incumbent and new service providers seeking to extend their networks to the customer premises and to deliver differentiated Ethernet-based services cost-effectively to multiple end-users
- enterprises, such as city networks, airports, railway and highway operators, and utility companies who want to build a network for internal use or who plan to offer services from the infrastructure they build

Business Challenges

Consider the Nortel Metro Ethernet Services units if you face the following business challenges:

- Do your users experience slow application response times?
- Do you have power users requiring Gb/s bandwidth to the desktop?
- Do your real-time services suffer from excessive network latency?
- Do you want an aggregation or core switch that is easy to install and use?
- Do you have multiple, distant offices

(up to 70 km) that need to share resources?

- Are you concerned about cost when considering switching purchase?
- Do you want gigabit performance without investing in a chassis-based switch?
- Do you want to deploy business and residential services using a common Ethernet-based infrastructure?
- Do you expect your business and the associated traffic in your network to grow within the next 6 to 18 months?
- Do you want secure and scalable separation of customer traffic?
- Do you want to create any-to-any connectivity?

Typical Applications

The Nortel Metro Ethernet Services Unit 1800/1850 enable maximum revenue generation by supporting multiple services and multiple VPNs per port in a compact one rack-unit-high design. For example, multiservice operators (MSOs) seek to deliver the triple play by using a single-fiber plant. The Nortel Metro Ethernet Services Unit 1800/1850 typically connects to the Nortel Metro Ethernet Routing Switch 8600 to enable a centralized user-network interface (UNI).

Metro Ethernet Services Unit 1800/1850 can fit into newly established provider networks, as well as demand-based additions to existing Ethernet access networks. This flexibility allows providers to realize the benefits in either deployment scenario. The Metro Ethernet Services Unit 1800/1850 can also be located at end-user premises—a branch office, multitenant and multidwelling units, or a service provider's point-of-presence. The unit can support an array of service-delivery scenarios, including point-to-point and ring configurations.

The Metro Ethernet Services Unit 1800 has 24 10/100 Base-T customer-facing ports and two Gigabit Ethernet network-facing ports (available as 2 SPF GBICs or 2 fixed 1000 Base-LX ports). The nonblocking architecture provides wire-speed switching for uncompromising performance.

The Metro Ethernet Services Unit 1850 has 12 10/100/1000 Base-T or SFP GBIC ports configured as a four-port (10/100/1000 Base-T and SFP combination) base unit plus two Media Dependent Adapter (MDA) slots, each of which can use a four-port 10/100/1000 Base-T MDA or a four-port SFP GBIC MDA.

Key Points

The key points of the Nortel Metro Ethernet Services unit are as follows:

- industry-leading, highly resilient Ethernet access ring with a less than 50-ms failover and highly efficient bandwidth aggregation in a switched Ethernet ring topology
- cost-effective and compact platform for ring or point-to-point access
- when combined with Nortel Metro Ethernet Routing Switch 8600, organizations benefit from:
 - the Ethernet UNI/NNI capabilities on the 8600
 - the reduced cost and potential ROI of a centralized UNI
- physical demarcation and secure customer separation on a shared uplink (cost optimized for high density demarcation points)
- multiple services on each physical interface for maximum efficiency and flexibility; high quality

of service (QoS) IP-video broadcast or video on demand (VoD) services can share the same infrastructure without costly overlay networks

- multiple classes of services for prioritization and traffic management required to offer and meet strict performance targets to increase end-user satisfaction
- end-to-end service management including tools to support performance monitoring, service assurance, and SLA measurement

Features and Benefits

- **Metro Ethernet Services Unit 1800** is available in two configurations. Both versions are equipped with 24 x 10/100 Mb/s customer-facing ports. A dc power version supports two fixed Gigabit Ethernet (LX) network-facing ports. An ac power version supports two Gigabit Ethernet network-facing ports, which accommodate small form factor pluggable (SFP) Gigabit interface connectors, including SX, LX and CWDM variants to meet various reach requirements.
- **Metro Ethernet Services Unit 1850** has 12 10/100/1000 Base-T or SFP GBIC ports configured as a four-port (10/100/1000 Base-T and SFP combo) base unit. In addition, two Media Dependent Adapter (MDA) slots exist, each of which can use a four-port 10/100/1000 Base-T MDA or a four-port SFP GBIC MDA. The unit can be dc or ac powered.
- **Configurations available:**
 - 1800: 24 x 10/100 Mb/s access, 2 Gigabit Ethernet trunk (fixed LX), dc power
 - 1800: 24 x 10/100 Mb/s access, 2 Gigabit Ethernet trunk (SFP GBIC), ac power
 - 1850: 24 x 10/100 Mb/s access, plus two MDA slots, each of which can utilize a four-port 10/100/ 1000 Base-T MDA or a four-port SFP GBIC MDA with either ac or dc
- **Physical demarcation** and secure customer separation are provided.
- **Multiple services per port** for maximum revenue generation and flexibility: Internet access, VPLS, VoIP, VoD, IP-video broadcast, and more
- **Cost-effective 1U high unit** provides efficient density for Greenfield build-outs or existing

network infrastructures.

- **Ethernet access ring resiliency:** less than 50-ms resiliency with efficient aggregation; supports up to 14 nodes per access ring for efficient access aggregation
- **Supports a variety of access methods:** incoming traffic can be tagged (802.1Q) or untagged Ethernet or stacked VLANs.
- **IEEE 802.1Q/p and IETF DiffServ:** enables multiple classes of service (for example, gold, silver and bronze) and tiered services with appropriate prioritization and traffic management.
- **Packet classification:** flexible classification is based on port, port plus VLAN, port plus VLAN plus 802.1p bit, port plus DSCP, and port plus 802.1p combinations, source/destination IP address, TCP/UDP source/destination port, source/destination MAC address.
- **Granular rate enforcement:** supports rate enforcement of committed information rates (CIRs) and burst window sizes, where packets can be policed in user-configurable 1-Mb/s increments from 1 Mb/s to line rate. Policing parameters can be set on various combinations, including per port, per port per VLAN, per port per VLAN per 802.1p bit, per port per DSCP, and per port per 802.1p basis.
- **Ease of management:** command line interface, SNMPv1/v2, and management applications include Java Device Manager, Preside Service Provisioning, Preside Multi-Service Data Manager and Enterprise NMS for ease of management and flexibility to adapt to specific operation environment for comprehensive Ethernet service provisioning, fault management, and performance monitoring.
- **RMON:** supports four groups of RMONs including statistics, history, alarms, events from remote monitoring, and operational simplicity.
- **IGMP v1/v2:** provides IP multicast support by examining (snooping) all IGMP traffic in the hardware at line rate and preventing unwanted data stream from affecting network or end-station performance.

- **End-to-end service management:** includes tools to support performance monitoring, service assurance, and SLA measurement. Integrated end-to-end VPN continuity checks make sure service is operating at all times and that SLAs are met. SNMP and Web-based management tools simplify operations and reduce expense by easing configuration and decreasing implementation times and troubleshooting activities.

When combined with other Nortel products such as the Metro Ethernet Routing Switch 8600, the Optical Metro 3500 Multiservice platform or the Optical Metro 5200 platform, providers can offer profitable Ethernet VPN services over fiber, RPR, or WDM.

Market Information

Nortel Metro Ethernet Services Unit 1800/1850 simplifies the delivery of Ethernet VPN services as part of an extremely scalable and resilient switched Ethernet solution. The nonblocking architecture provides uncompromising performance in a 1U-high, cost-competitive solution. The unit delivers tunable bandwidth from 64 KB/s to 100 Mb/s in granular increments. Packet classification, QoS, and SLA management tools allow providers to offer tiered services to customers.

Nortel Metro Ethernet Services Unit 1800/1850 is a high performance, cost-effective platform purpose-built for the edge of provider networks as the delivery point for Ethernet-based services. The unit can be deployed in either a ring-based or point-to-point topologies in the metro access network.

When combined with the Nortel Metro Ethernet Routing Switch 8600, the Nortel Metro Ethernet Services Unit 1800/1850 provides 50-millisecond restoration time with the highest levels of scalability and the ability to map individual customer VLANs to separate customer VPNs.

Technical Specifications

	1800	1850
		
Physical specifications	Weight: 2.8 kg (6.2 lb) Height: 4.4 cm (1.73 in.) Width: 44.1 cm (17.3 in.) Depth: 20.8 cm (8.19 in.)	Weight: 4.7 kg (10.4 lb) Height: 4.4 cm (1.73 in.) Width: 44.1 cm (17.3 in.) Depth: 36.6 cm (14.4 in.)
Performance specifications	Frame forwarding rate 8.8 Gb/s switching fabric capacity (64-byte packets) 6.6 Mp/s packet forwarding rate Port filtering performance (64-byte packets) Wire speed Address database size: 8 K (64-byte packets) Max MTU size Up to 1600 bytes Data rate: 10 or 100 Mb/s user-facing	Frame forwarding rate 24 Gb/s switching fabric capacity (64-byte packets) 17.9 Mp/s packet forwarding rate Port filtering performance (64-byte packets) Wire speed Address database size: 16 K Max MTU size Up to 9 K bytes Data rate: 10 or 100 or 1000 Mb/s
Interface options	10 Base-T/100 Base-TX RJ-45 (8-pin modular) connectors for MDI-X interface 1000 Base-X small form factor pluggable	10/100/1000 Base-T RJ-45 (8-pin modular) connectors for MDI-X interface 1000 Base-X small form factor pluggable
Electrical specifications	- ac power supply: 100–240 V ac, 47–63 Hz universal - dc power supply: –40 to –60 V dc (48 V Nominal) (48 V Nominal)	
Environmental specifications	- Operating temperature: 0° to 60°C (32° to 140°F) - Storage temperature: –25° to 70°C (–13° to 158°F) - Humidity 5% to 95% noncondensing - Altitude 3024 m (10 000 ft) maximum	
Safety agency approvals	UL60950-2000 • CSA 22.2 #60950-00 • IEC 60950/EN 60950 • UL 94-V1 flammability requirements for all PC boards • NOM-019	
Electromagnetic emissions	Meets the following standards: • U.S.: FCC CFR47, Part 15, Subpart B, Class A • Canada: ICES-003, Issue 3, Class A • Australia/New Zealand: AS/NZS 3548 1995, Class A A1:1997/A2:1997 Class A • Japan: VCCI-V-3/02.04 Class A • Taiwan: CNS 13438, Class A • Europe: EN55022: 1998/A1:2000 EN61000-3-2:2000, EN61000-3-3:1995/ A1:2001, CISPR 22-1997/A1:2000 Class A	
Electromagnetic immunity	EN55024 :1998/A1 :2001	

Ordering Information

For further information, contact your local Nortel representative.

Nortel Business Continuity System 3000 Portfolio

The Nortel Business Continuity System (BCS) is an open portfolio that simplifies data mobility between data centers and migration to the IT Thin Branch Office architecture. The products in the BCS 3000 portfolio accelerate and cache data traffic, efficiently network locations to increase the WAN performance-to-price ratio, and protect business operations for the distributed enterprise. The BCS 3000 portfolio complements other Nortel enterprise portfolios that comprise Nortel storage extension, IP Telephony, Ethernet switching, Wireless LAN, and security products.

The Nortel integration of industry-proven hardware and software to address the business challenges in the data center and branch office results in two unique configurations of the BCS portfolio:

- Business Continuity System 3000 at the Data Center
- Business Continuity System 3000 at the Branch Office

Nortel Business Continuity System 3000 Data Center



Overview

The Business Continuity System 3000 Data Center configuration cost-effectively simplifies data file mobility between data centers. This configuration increases WAN efficiency by natively consolidating data and storage networks onto a common WAN link and by delivering definable time-of-day bandwidth management. The definable time-of-day bandwidth management assigns bandwidth to the needed application at a given time of day.

Data centers use the Nortel Business Continuity System 3000 Data Center configuration to extend data centers to secondary and regional data centers to support data protection and regulatory compliance. At the data center, the BCS 3000 provides storage extension between primary data centers and secondary data centers for disaster recovery and for regulatory compliance. Businesses set up the WAN connectivity between these locations by using a native Ethernet service or Coarse Wavelength Division Multiplexing (CWDM) on dark fiber.

Ideal For

The Nortel data center is ideal for:

- Enterprise companies that rely on storage application vendors for storage extension solution.
- Service providers and cable operators that want to enable new data center and intra-office connectivity services that can consolidate fiber channel (storage) and Ethernet (data) networks into an increased WAN service offering.
- System integrators and consultants where storage extension is a critical element of the business continuance (BC) and disaster recovery (DR) solution.
- Medium to large enterprises that need to store a copy of their data at a remote location for disaster recovery or regulatory compliance.
- Enterprises that need to improve WAN efficiency and cost-effectively merge information storage and Ethernet traffic onto the same WAN link.

Business Challenges

Consider the Nortel data center if you face the following business challenges:

- Does your organization need to replicate storage across thousands of kilometers?
- Does your organization have applications (data backup and fixed backup in Windows) that are time-of-day sensitive and you want to avoid an overlay service?
- Is your organization subject to regulatory compliance or government mandates that relate

to backing up data?

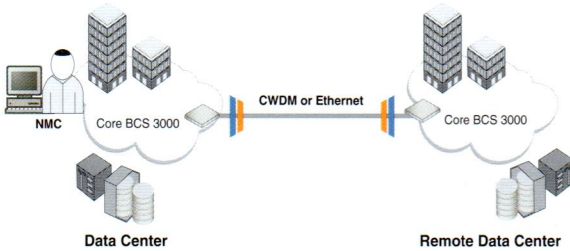
- Does your organization want a simple WAN-optimized solution at a lower cost than traditional storage extension solutions?
- Does your organization want to mitigate the business risk of information loss by using multiple disaster recovery strategies at an affordable cost?
- Does your organization need to have storage and data applications coexist on the same WAN link without adding storage to IP conversion appliances?
- Does your enterprise need to ensure that your network devices and computers do not compromise your network security?

Typical Applications

Typical applications of the Nortel data center include:

- Point-to-point, cost-effective, converged, and compressed inter-office connectivity.
- Very large organizations that want to create a third data center for business continuity or disaster recovery.
- Enabling synchronous and asynchronous certified third-party replication applications (EMC).
- Cable and service providers that want to offer enhanced CPE inter-office connectivity services.
- Deferring or eliminating WAN upgrades through time-of-day bandwidth management, enhanced error correction, and hardware-based compression.

Network Diagram



Key Points

To deliver an agile, secure, high availability data centers, the Business Continuity System 3000 Data Center offers:

- native transport of SAN (Fiber Channel) and LAN (Ethernet) protocols across a common WAN link
- distance extension for Fiber Channel to over thousands of kilometers
- definable time-of-day bandwidth management scheduler
- optimized WAN bandwidth use through hardware compression and improved flow control mechanisms
- increased WAN error tolerance using forward error correction (FEC)
- comprehensive WAN monitoring and reporting capabilities

Features and Benefits

Equipped with the Dynamic Network Module (DNM), the BCS 3000 Storage Networking technology delivers:

- **Advanced Networking:** native transport of storage networking protocols (Fibre Channel and FICON) and LAN protocols across a common WAN link eliminates the complexity created when translating one protocol to another. This native transport approach increases reliability and simplifies network troubleshooting.
- **Distance Extension:** proven Storage Distance Extension technology is embedded into the BCS 3000 to eliminate performance degradation created by link latency over long

distances. This extension technology permits storage links to over thousands of kilometers with no performance degradation.

- **Bandwidth Management:** definable time-of-day Bandwidth Management that permits the WAN manager to allocate bandwidth to LAN or storage applications by time of day. This protects end-user productivity by delivering guaranteed bandwidth to the required LAN or storage application at the required time of day. In addition, unused bandwidth from one application is made available to other.
- **Optimized WAN Performance:** per port provisionable hardware-based compression for both storage and data networks coupled with enhanced flow-control mechanisms.
- **Increased WAN Reliability:** using embedded Forward Error Correction (FEC) mechanisms that significantly enhance link reliability under degraded WAN conditions. These errors are corrected automatically at the transport layer and totally transparent to the application and upper layer protocols.
- **Management Simplicity:** delivers a new level of management simplicity that delivers global visibility to network performance from a centralized management station. The embedded advanced monitoring capabilities provide network managers with detailed link utilization reports broken down by time-of-day for each application. These advanced reports enable IT managers to properly size WAN links and set appropriate QoS policies.

Market information

While people are key assets of any enterprise, the IT networking, computing, and storage infrastructures are critical for continuing business effectiveness. With the drive to consolidate the IT infrastructure, distributed corporate information, and applications back into the data center, it is becoming increasingly critical to secure and protect the data center. Regulatory compliance equally drives new needs for information handling, privacy, security, business continuity, and disaster recovery.

In a single platform, the Nortel BCS 3000 Data Center solution delivers multiple services and applications, such as Wide Area File Services (WAFS), DNS, DHCP, print services, Exchange e-mail optimization, and full support of Microsoft security services, including IPSec and signed SMB file services. The Nortel BCS 3000 embeds Microsoft Storage server 2003 to complete the end-to-end Microsoft Windows trust model, something many of Nortel competitors do not offer.

The values realized when an enterprise implements the Nortel BCS 3000 Data Center solution include:

- A reduction in total cost of ownership by as much as 55 percent.
- A trusted network infrastructure that eliminates eavesdropping on all network traffic and centralization of branch office data in a protected data center environment without affecting remote user application performance.
- Advanced global reporting of the network that does not complicate network management.
- Unlike the competition, the Nortel BCS 3000 is built on an agile platform that allows modules, whether hardware or software based, to be installed in any slot to deliver any application. This flexibility adapts to changing requirements and technologies.

Nortel provides global support and professional services with a local presence in 230 locations around the globe. Nortel Enterprise channel infrastructure helps to ensure that help is close at hand to support the BCS 3000.

Technical Specifications

	BCS 3000
Physical specifications	Height: 6.7 cm (2.625 in.) Width: 19.1 cm (17.5 in.) Depth: 45.7 cm (18 in.) Weight: 9.97 kg (22 lb) (fully loaded with three modules) 1.5 rack-unit (RU), 3-slot rack-mountable chassis Mounting: rack-mount: 48.3 cm (19 in.) or 58.4 cm (23 in.) (optional), desktop and wall-mount 3 main status LEDs for AC power and system status
Service provisioning	Management: SSHv2, SNMPv2, RADIUS Management UI: CLI and BCS Director Monitoring: hardware, security, alarms, and events, Thermal and statistics
Power	ac input power: 50/60 Hz 90–240 Volt ac dc input power: -48/-60 Volt dc Power consumption: Maximum 225 Watts
Regulatory approvals	Safety CAN CSA 60950-1 UL 60950-1 IEC/EN 60950-1:2001 IEC/EN 60825-1:2001 IEC/EN 60825-2:2004 EMC FCC Part 15 Class A EN55022A EN55024
Environmental specifications	Operating temperature: 0° to 40°C (32°F to 104°F) Relative humidity: 0 – 95%

Ordering information

For further information, contact your local Nortel representative.

Nortel Business Continuity System 3000 Branch Office

Overview

The Business Continuity System 3000 Branch Office configuration improves the delivery of branch office applications across the WAN and enables the IT Thin branch office architecture. This simplified approach lowers the total cost of ownership for remote locations while improving security, recoverability, and user productivity.

The Business Continuity System 3000 Branch Office eliminates the need for local servers or IT appliances. This non-disruptive solution natively integrates into existing branch office computing environments and WAN infrastructures. To support IT centralization models, the Business Continuity System 3000 Branch Office offers a single global network view with advanced management, monitoring, and reporting capabilities.

Ideal For

The Nortel branch office is ideal for:

- Businesses that need to develop and implement a cost-effective strategy for a geographically distributed enterprise computing environment.
- Businesses with low bandwidth and high latency WAN links.
- Businesses that want to lower the total cost of ownership (TCO) of their remote locations while improving security, recoverability, and end-user productivity.
- Business with remote offices that want to provide core branch office computing facilities while removing the need for services or IT applications in the branch.
- Businesses that want to migrate towards an IT Thin infrastructure without disrupting their existing installed WAN communications infrastructures.
- Enterprises that want to extend their LANs worldwide to give global users a way to work from the same files in real-time.

Business Challenges

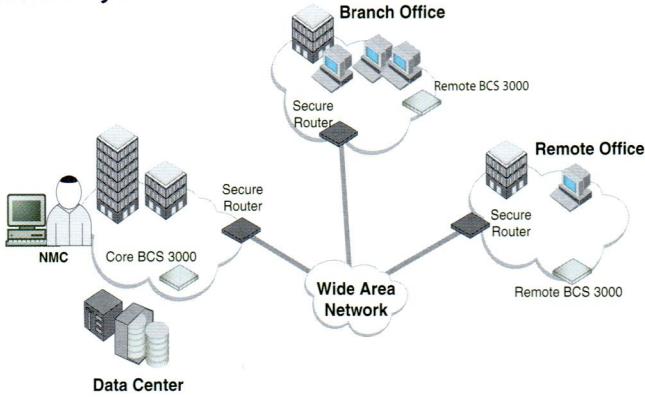
Consider the Nortel branch office if you face the following business challenges:

- Does your enterprise need to reduce IT operational costs associated with maintaining geographically distributed offices while improving overall WAN performance-to-price ratio?
- Does your enterprise need to ensure data recoverability, regulatory security compliance, and risk mitigation for information that your users store?
- Does your enterprise need to ensure that your network devices and computers do not compromise your network security?
- Does your enterprise need to respond to governmental regulations that demand a disclosure of internal controls?
- Does your enterprise want to extend its LANs worldwide to give global users a way to work from the same files in real-time?

Typical Applications

- Hub and spoke distributed architecture deployments where the hub is the data center.
- Enhancing WAN links that are T1, E1, or Satellite and organizations that try to reduce the amount of network traffic traversing these links.
- Native integration into a secure Microsoft trusted infrastructure and organizations that need tight integration with a Microsoft environment.
- Organizations that need to centralize their data for compliancy by moving to a single file copy.

Network Diagram



Key Points

The Business Continuity System 3000 Branch Office offers:

- server-based Wide Area Data Sharing
- Windows File System (CIFS) acceleration
- local RAID disk caching
- advanced file handling capabilities
- full Microsoft Services Support (DNS, DHCP, Print Services, IPSEC, Signed SMB, Security model, and Active Directory)
- remote manageability

Features and Benefits

- Enables IT managers and directors to reduce their operational costs associated with supporting remote IT assets by enabling an IT-Thin branch office environment with a solution that pays for itself typically in 12 months or less and reduces overall Total Cost of Ownership by up to 55 percent.
- Server-based Wide Area Data Sharing is a network utility solution that allows reliable, high-speed transfers and file sharing across a common WAN link.
- Full integration with Microsoft security and network services including IPSEC, SMB packet signing file services, Distributed File System (DFS) support, active directory, file security, DNS, DHCP, and print services.
- Accelerates Microsoft Windows file system (CIFS) and improves end-user productivity for opening and writing remote files between

68 percent and 99 percent.

- Reduces WAN file sharing traffic by up to 90 percent with typical WAN bandwidth savings of 20 percent.
- Persistent logging enables all states (leases and flush queues) to be synchronously logged to disk. This ensures correct recovery from reboots and makes asynchronous write-back safe in the event of a failure.
- Uses Caching over IP (SC/IP) that is a WAN-optimized file sharing protocol that minimizes cache miss overhead.
- Incorporates a fault tolerate RAID disk-caching system that optimizes disk performance and ensures no affect on end user productivity if a disk failure occurs.
- Includes a prepopulation (PUSH) GUI-driven scheduler that automates the movement of popular or large content files into remote caches at remote sites. The Scheduler PUSH can also be initiated at the remote site so that directories, folders and files are sent to it from the Core Data Center at predetermined times.
- Delivers a new level of remote management simplicity that delivers global visibility and manageability from a single management station using either BCS Director or the CLI.

Market Information

In a single platform, the Nortel BCS 3000 Branch Office solution delivers multiple services and applications, such as Wide Area File Services (WAFS), DNS, DHCP, print services, Exchange e-mail optimization, and full support of Microsoft security services, including IPSec, and signed SMB file services. The Nortel BCS 3000 embeds Microsoft Storage server 2003 to complete the end-to-end Microsoft Windows trust model, something many of Nortel competitors do not offer. The values realized when an enterprise implements the Nortel BCS 3000 Branch Office solution include:

- A reduction in total cost of ownership by as much as 55 percent.
- A trusted network infrastructure that eliminates eavesdropping on all network traffic and

centralizes branch office data in a protected data center environment without affecting remote user application performance.

- Advanced global reporting on a global basis of the network that does not complicate network management.
- Unlike the competition, the Nortel BCS 3000 is built on an agile platform that allows modules, whether hardware or software based, to be installed in any slot to deliver any application. This flexibility adapts to changing requirements and technologies.

Nortel provides global support and professional services with a local presence in 230 locations around the globe. Nortel Enterprise channel infrastructure helps to ensure that help is close at hand to support the BCS 3000.

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Environmental specifications	Operating temperature: 0° to 40°C (32°F to 104°F) Relative humidity: 0 – 95%

Ordering information

For further information, contact your local Nortel representative.

Nortel Select Products



Nortel, a global leader in converged voice, data, and multimedia networks, has a vision to enrich global communications by transforming networks and eliminating boundaries. The Nortel Developer Program builds on this vision by establishing relationships with technology businesses whose innovation, customer insight, and business strategies align with and complement those of Nortel.

From this developer community, Nortel strategically selected products that create significant value for its customers. Customers can order Nortel Select Products direct from Nortel, thus eliminating the need to establish multiple sales or reseller agreements with each Select Product vendor. Nortel selected these products as the result of business plan analysis and customer input.

To provide peace of mind to our customers, Nortel Select Products must achieve Compatible Product status to be eligible for Select Product designation. Vendors maintain Compatible Product status throughout new software releases of the Select Product and the supporting Nortel communications platform to retain Select Product status.

Nortel Select Products are strategic building blocks for Nortel innovative architecture. These products help to provide Nortel customers with the most effective and efficient solutions for their communications needs.

Nortel Select Products are available regionally. For availability or for more information about all Nortel Select Products, visit www.nortel.com/select or contact Nortel by e-mail at select@nortel.com in North America or SPP_EMEA@nortel.com in EMEA.

The Nortel Select Products include:

- AMC Multi-Channel Integration Suite
- Concord Communications eHealth® Suite
- ConverTec Console.NET
- Datapulse IP Operator Gateway
- ipDialog SipTone III SIP Phone
- Mediatrix
 - VoIP Access Devices and Gateways
 - IP Analog Gateway from Mediatrix
- Mertek JCS Cable Assembly
- Qovia E911 Location Gateway Server (LGS)
- Quintum Tenor Multipath VoIP Gateway
- Real Time Monitors Reporting
- Soft-ex Call Management Solutions
- Symon Symon Enterprise Server
- Teleopti Contact Center Solutions
- Unique Communications CAIRS OSS

AMC Multichannel Integration Suite

Overview

AMC Multichannel Integration Suite, from AMC Technology, is a suite of enterprise application software components. The suite provides prepackaged integration between leading Customer Relationship Management (CRM) applications such as mySAP CRM, Siebel 7, Oracle PeopleSoft, Microsoft CRM, and a full range of Nortel contact center solutions and communications servers. With this suite, customers can manage their own customer interactions more efficiently while delivering superior levels of customer service.

The AMC Suite supports a full range of Nortel contact center solutions and communications servers including the Nortel Communication Server 1000 (CS 1000), Business Communication Manager (BCM), and Contact Center Manager Server (CCMS). Standard Nortel CTI server interfaces such as the Nortel Communications Control Toolkit (CCT) and LAN CTE for BCM provide support.

Contact centers can use the AMC Suite to enable telephony (CTI) functions in their CRM desktop including softphone controls, caller identification, and screen population. Agents and knowledge workers can place, receive, and transfer customer interactions with full, real-time access to CRM customer data. Business rules and customer data residing in the CRM application enhance call routing by ensuring a customer reaches the right agent at the right time.

Customers use the server-based, open architecture of the AMC Suite to manage a true multi provider environment that capitalizes on existing or new infrastructure investments. Globally, thousands of agents use the AMC Suite daily. AMC solutions help innovative organizations to work more effectively and deliver high levels of customer service.

Ideal for

Contact centers that have deployed or are considering deploying packaged CRM applications such as mySAP CRM, Siebel 7, Oracle PeopleSoft and Microsoft CRM for their agents and knowledge workers. This includes contact centers of all types and sizes that support companies in any industry or location.

Business Challenges

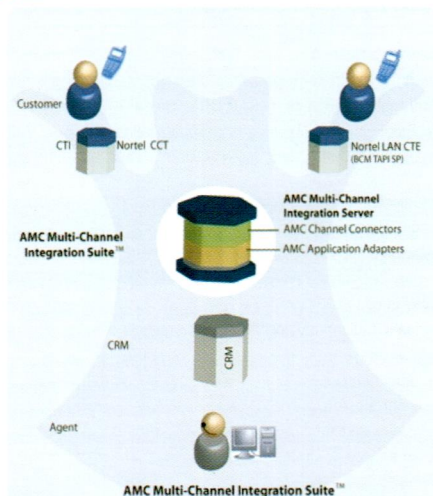
Consider the AMC Multichannel Integration Suite if you face the following business challenges:

- How can I improve the customer experience through personalized, tailored, and expanded customer service?
- How can I improve operational effectiveness by using efficient processes, distributed or centralized staffing, or simple, consolidated desktop applications?

Typical Applications

The typical customer is a company that uses a packaged CRM application and recognizes the need to integrate with contact center or voice communications systems to enhance its ability to serve its customers and to improve operational effectiveness. Often, the customer's company is undergoing a significant investment or upgrade in its contact center infrastructures to achieve specific business objectives. The company can have large or distributed contact centers that can capitalize on the investment in common systems. Companies often use a CRM application for other functions within the enterprise such as sales, marketing, and internal IT. Knowledge workers experience the same benefits as their contact center agent colleagues from integrating CRM and telephony.

Network Diagram



Features and Benefits

Key features

- Provide prepackaged integration with leading CRM applications and Nortel contact center solutions.
- Enable full telephony functionality in CRM desktop applications including softphone controls, caller identification, and screen population.
- Support standard Nortel CTI server interfaces including Nortel Communications Control Toolkit (CCT) and LAN CTE for BCM.
- Provide a robust, proven architecture successfully deployed at numerous large enterprises worldwide.
- Support call control functions including agent login and work mode, telephony channel,

conference, transfer, and outgoing call handling.

- Enable full e-mail channel functionality.

Key benefits

- Expand the CRM agent desktop function to support full contact center capabilities.
- Have agents effectively place, receive, and transfer interactions with full, real-time access to customer data in the CRM application.
- Manage real-time customer interactions in a true multiprovider environment using existing or new infrastructure investment.
- Provide a verified solution for efficient implementation and a low total cost of ownership.

Ordering Information

For further information, contact the Nortel Select Product Program at:

North America - (615) 432-4995 or select@nortel.com

EMEA - + 44 2890 36 3665 or SPP_EMEA@nortel.com

Concord Communications eHealth Suite

Overview

The Concord eHealth Suite empowers network managers to control network performance and ensure Quality of Service (QoS) across the network portion of the infrastructure. The eHealth Suite is the only solution that manages, troubleshoots, and fine tunes every computerized business process across applications, systems, and networks.

Managing voice communications servers across the enterprise is traditionally challenging when the enterprise introduces new IP architectures into the voice network. Monitoring availability and performance among disparate systems is complex and inefficient without the correct tools. The Concord eHealth for Voice is a robust performance management solution that supports the Nortel Communication Server 1000 (CS 1000). The application can poll key voice and VoIP statistics to a centralized database from multiplatform, multiapplication, diverse voice systems.

With eHealth for Voice, accurate current and historical system information is always available for complete planning, trending, and analysis. Analysis can span any interval, from hour-by-hour totals to monthly summaries. eHealth for Voice eliminates manually collecting data and the labor-intensive effort of report compilation and grade-of-service determination, which helps deliver improved voice system performance and availability at a low cost.

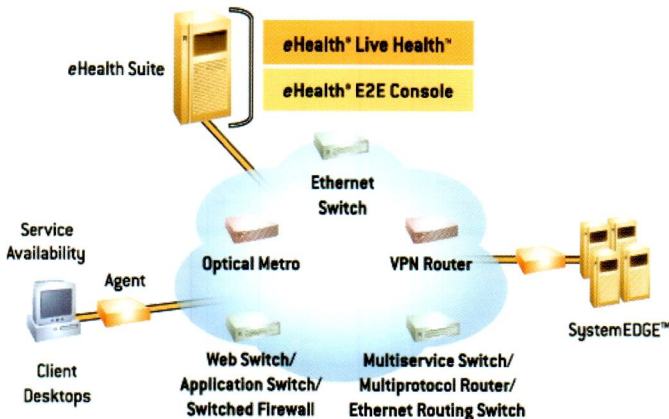
Ideal for

The customer profile for the eHealth products and services is any customer that wants to simplify unified fault and performance management of converged networks while requiring the industry-leading technologies that Nortel and Concord provide.

Typical Applications

Any customer who has deployed or is considering deploying voice solutions over a data network, has deployed a data network, or both and needs a management solution that helps define capacity-planning measures, provides intuitive reporting, identifies trends, and articulates service level agreements (SLA).

Network Diagram



Features and Benefits

The eHealth Suite enables Nortel customers to:

- Manage performance and availability of LANs, WANs, routers, switches, frame relay, ATM, remote access equipment, QoS, wireless LAN, DSL, VoIP, and cable technologies.
- Ensure IT infrastructure equipment can withstand peak activity periods.
- Measure network use patterns to identify when to downgrade or when to redeploy under-used resources.
- Measure current performance to set service level goals and document subsequent performance for internal clients or for customers to verify compliance with service level agreements (SLA).
- Identify which resources are at risk of failure with the help of embedded intelligence that allows you to prevent outages and ensure availability.
- Perform continuous, active tests to identify faults and response degradation for network circuits.
- Capitalize on existing investments through integration with various Nortel products.

The eHealth for Voice enables Nortel customers to:

- Manage multiple voice systems, based on multiple platforms, from a single interface – maximizing
- Engage staff efficiency.
- Analyze VoIP statistics to monitor call quality and bandwidth.
- Maintain a repository of historical data, including grade of service, for capacity analysis to maximize
- Track service availability and performance.
- Poll simultaneously an unlimited number of systems with scalable architecture.

Market Information

Target markets for the Concord eHealth Suite include banking, hospitality, insurance, health care, manufacturing, retail, higher education, government, service providers, enterprise, and carrier markets.

Ordering Information

For further information, contact the Nortel Select Product Program at (615) 432-4995 or select@nortel.com.

ConverTec Console.NET

Overview

The ConverTec Console.NET is a PC-based attendant console for the Nortel Norstar, Business Communications Manager 200 and 400 (BCM200 and BMC400), and Business Communications Manager 50 (BCM50). Console.NET provides the capability for Attendants to answer and direct callers in an informed, professional manner. Through a Web browser interface, IT administrators can extend attendant console capabilities to the enterprise to allow a single attendant to handle calls effectively and efficiently for multiple locations.

Ideal for

Console.NET is ideal for a business that uses a live attendant to greet and direct customers for a single or multioffice application.

Business Challenges

- Which person in an organization can influence how the image of an organization is presented? If you answered the Attendant, you are correct.
- With the competitiveness of business today, the need to differentiate your company from the others is crucial. Organizations using a live attendant to answer calls rely on the attendant to present the company image to the caller.

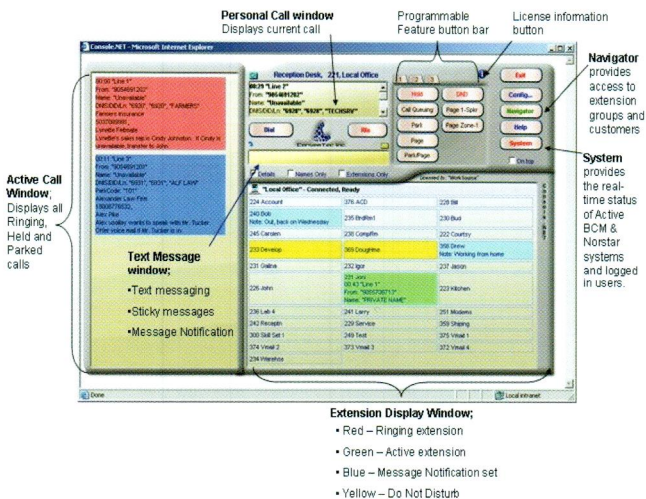
Typical Applications

Before answering a call, Console.NET presents information about the caller to help the attendant direct the call to the appropriate person or group in the local or remote office. By default, incoming

call information provided to the attendant includes CLID, DID/DNIS, line name and number, target line name, and ring time. The Enable Call Preview feature displays information about the caller including company name, contact name, and notes such as with whom the caller usually speaks.

An attendant can monitor a specific group of extensions or all extensions including voice mail, hunt groups and skill set Transfer DN's. Console.NET provides the following telephone features:

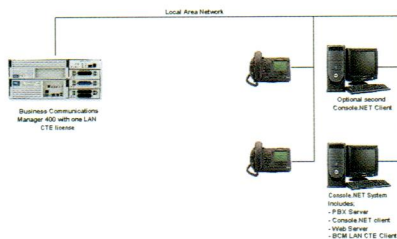
- Answer
- Call Queuing (used with multiple incoming calls, Call Queuing answers the oldest ringing call first)
- Hold
- Dial
- Call Camp
- Call Waiting (an Attendant can Camp a call with



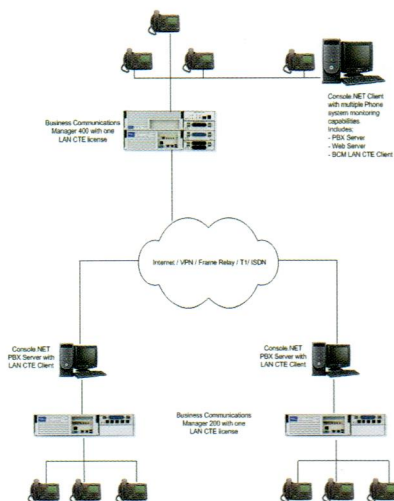
- a scrolling message to a specified phone and allow the user to perform specific call control features using the soft keys on the phone)
- Park
- Park/Page
- Transfer (blind and screened)
- External Transfer

- Conference
- Page (zone control and speaker)
- Voice Mail Transfer
- Voice Mail Transfer to a remote BCM200/400 or BCM50 (central voicemail not used)
- Voice Call
- Dial, Speed Dial

Network Diagram



Traditional Console.NET architecture - The Console.NET Web Server and PBX Server, along with the BCM LAN CTE Client are running on one Windows 2000 or XP PC. Additional Console.NET client licenses may be added.



Multi-site Console.NET architecture - In this configuration, a single Console.NET user can monitor, in real-time, the status of remote users on a networked or non-networked BCM's. Each remote site must have a Console.NET PBX Service running with a single BCM LAN CTE license.

Key Points

The key points of the Console.Net include:

- Console.NET is browser-based. Access to Console.NET is through Microsoft Internet Explorer, thereby eliminating the need to install software on the client PC.
- Call control to remote BCM200/400, BCM50, and Norstar systems. Support exists for the Intercom, transfer, and voice mail transfer (without central voice mail).
- Monitor telephone activity at your own office and at branch offices. Businesses use Console.NET for a single site application or to monitor telephone activity from multiple BCM200/400, BCM50, and Norstar systems.
- Color-coded extension buttons allow the attendant to quickly see the status of an extension. Console.NET displays idle, active, ringing, DND, message notification, and out-of-service status.
- Park, Camp and Transfer recalls the attendant and displays the recall type and from which extension the call came.
- Console.NET is a global product with multilingual support. Languages supported include English, French Canadian, French, German, Italian, and Spanish. The user's Internet Explorer language settings determine default language Console.NET uses.
- In a Business Center environment, Console.NET provides specific greetings for the attendant to read, DID/target line name, contact information including e-mail and Web site addresses, and more.
- Console.NET requires one BCM 200/400 LAN CTE or one Norstar CTA100 for as many attendants as a company needs.
- Easy to install, set up, and train. ConverTec designed Console.NET with the telephone technician in mind. No special network or computer training is necessary.
- Console.NET runs on any Microsoft Windows 2000 Pro or Windows XP PC or Server. Anyone with LAN, WAN, or Internet access can operate Console.NET.
- Multimedia Sales Demo compact disks are available.

Features and Benefits

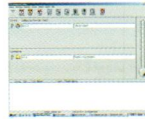
Console.NET provides a number of advanced features including:

- Call control to remote BCM200/400, BCM50, and Norstar systems. Intercom, transfer, and voice mail transfer (without centralized voice mail) are available.
- The attendant can use Scrolling Text Messaging to send an unlimited-length text message to a Nortel telephone for local and remote offices.
- The attendant can use Sticky Notes to attach a new or predefined message to a call. This assists an attendant return to a parked or on-hold caller.
- Attendants use Message Notification to type a message that corresponds to an extension to provide status information about employees.
- Telephone Messaging feature to select 1 of 99 available messages to display on the Console.NET interface and on other phones. For example, the message "In a meeting" appears on the display of the internal calling party.
- URL Reverse Lookup feature sends the incoming CLID to a specified Web site such as 411.com and return the name, address, and zip code of the calling party.
- Comprehensive Reporting provides information about telephone calls both to and from an office along with intercom calls between employees. Reports include:
 - Calls by Customers
 - Call type to Extensions
 - Inbound Calls by Extensions
 - Outbound Calls by Extension
 - Intercom Calls
 - Calls by DID/DNIS
 - Call Duration

Ordering Information

For further information, contact the Nortel Select Product Program at (615) 432-4995 or select@nortel.com.

Datapulse IP Operator Gateway



Overview

Operator Gateway offers operators IP connectivity to the desktop. Operators can continue to answer and transfer calls as before with no need for extensive training, which saves time and resource costs. Operator Gateway works with the Datapulse screen-based operator console, Operator Module, which provides operators with the most advanced and popular console application available for Nortel IP systems.

Ideal for

Operator Gateway is suitable for all business sizes, from small companies to large multinationals that use the Nortel Communications Server 1000 (CS 1000) or Meridian 1 PBX with CS 1000 software. Specific targets are customers that currently use an M2250 and that want to move to IP because the M2250 does not connect easily through an IP data infrastructure.

Most organizations require an operator solution to improve call handling. Those that still use paper directories to search for names and numbers to transfer calls see a fast return on investment (ROI) after implementing a screen-based console

Operator Gateway is ideal for any organization that relies on operators or receptionists to handle incoming calls and to transfer them quickly and accurately. A receptionist on a stand-alone system or several operator centers on a network of switches can exist at multiple sites. Target markets include banking, insurance, hospitality, health care, councils, police forces, pharmaceuticals, utilities, retail, manufacturing, universities, enterprise, SME, and international organizations.

Business Challenges

Consider the Operator Gateway if you face the following business challenges:

- Do your operators use an M2250 or another flatbed console?
- Do you have high call volumes?
- Do you struggle to hit targets and service levels?
- Do you use paper-based directories?
- Do you use an operator solution that cannot

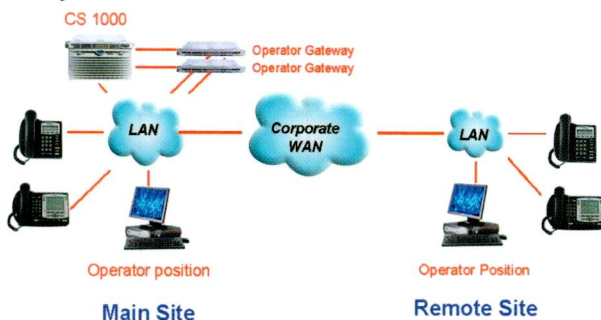
integrate with your current directory?

- Do you have operators at multiple sites?
- Do you need centralized operator services across all locations?
- Do your operators need to work on an IP network?
- Do you have a high operator turnover or do you regularly use temporary staff?
- Do you want a disaster recover strategy of your operator services?
- Do you need to allow operators to work anywhere on the corporate network?

Typical Applications

Companies that plan to deploy, or have deployed IP, recognize the need to integrate IP with their operator services to enhance their ability to serve their customers and to improve operational effectiveness. Often, these companies experience a significant investment into or upgrade of their sites or organization-wide infrastructures to achieve their specific business objectives. These companies can have one operator or several operator centers at multiple sites and want to capitalize on investment in IP with minimal disruption to their operators and callers. The companies can already have an operator solution or use the M2250 but cannot use it on the new network. The customer can have a busy switchboard and wants to improve their call handling capabilities and to transfer calls as quickly as possible. The companies can also have a large employee database with multiple contacts over multiple sites that can integrate with the operator solution for fast searches with current, reliable results.

Network Diagram



Key Points

Operator Gateway supports both TDM and IP Nortel environments and is the only full-feature console solution to offer IP connectivity to Nortel CS 1000.

With Operator Gateway, customers can locate their operator centers anywhere on the corporate network (for example, at another site or even another country). This offers virtual operator center capability and disaster recovery benefits. If part of the network fails, business can continue while reducing disruptions and lost calls.

Features and Benefits

Key features

- IP-enabled screen-based console available for Nortel CS 1000
- Operators can use a screen-based console on an IP network
- Operators can be anywhere on the corporate network
- If a site is lost, operators can still continue to take calls offering disaster recovery capability
- Simple connectivity means simple installation and maintenance
- Capitalize on investment made in existing consoles and IP
- Paired with Operator Module, the solution provides unrivalled functionality and call-handling efficiency on an IP network

Key benefits

- Minimal training means reduced disruption for both operators and callers
- Operators can work anywhere on the network away from noisy environments or in offices

close to home to improve productivity and morale

- If part of the network fails, business can continue, minimizing disruptions and lost calls.
- Accurate, consistent greetings and efficient transfer of all calls
- Achieve short individual call handling times and process high call volumes
- Easily identify the source of a call
- Attendants have the flexibility to answer calls based on priority
- A choice of greetings according to incoming call identity key or time of day are available
- The ability exists to track people and location changes within the organization and note staff absences
- Callers always connect to the appropriate person
- Operators have increased job satisfaction and less stress
- Temporary operators can have an Immediate high level of knowledge
- Company-wide desktop access exists to corporate directory
- Measure and quantify operator performance
- Assess call patterns and staffing requirements.
- Produce reports and management information about call data
- Visually Impaired Option allows operators who are blind or who have impaired vision to use Operator Module

Ordering Information

For further information, contact the Nortel Select Product Program at + 44 2890 36 3665 or SPP_EMEA@nortel.com

ipDialog SipTone III SIP Phone



Overview

The ipDialog SipTone III SIP phone integrates seamlessly with Nortel Communication Server 1000 (CS 1000) and Multimedia Communications Server 5100 (MCS 5100) systems. This cost-effective solution unlocks the capabilities of all components in the system. The SipTone III phone builds on the SIP standard to provide advanced calling, conferencing, and messaging features, and protects the customer's investment with a remotely upgradeable flash-based design. The SipTone III standard features include integrated Power over Ethernet (PoE) and an Ethernet switch.

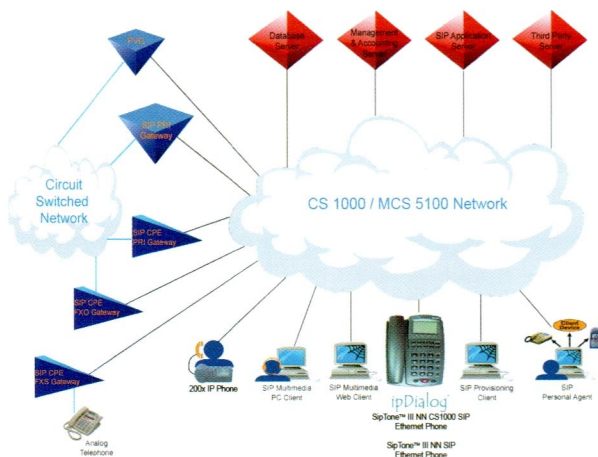
Ideal for

The SipTone III phone is ideally suited for use in business enterprises of all sizes. The cost-effective phone is robust in design and provides an advanced feature-set for business use.

Business Challenges

Today's business environments require a phone system that is easy to implement, scalable, and allows the callers to manage calls efficiently. The SipTone III phone achieves these needs, while reducing the complexity and the time typically needed to deploy a feature-rich phone. Nortel and ipDialog provide scalability that offers a solution tailored to the customer's needs.

Network Diagram



Key Points

The Nortel Communication Server 1000 and the MCS 5100 enable feature-rich IP telephony and multimedia deployments based on open standards. The ipDialog SipTone III phone complements the Communication Server 1000 or MCS 5100 deployment. The SipTone III brings Find Me, Follow Me and other advanced

call-routing features available through the MCS 5100 to the end user.

The SipTone III phone is a full-featured Ethernet phone that accelerates the deployment of IP telephony services for business customers. Fully tested for interoperability with Nortel Communication Server 1000 and MCS 5100,

the SipTone III is based on the widely deployed SIP standard. ipDialog designed the SipTone III to meet the varied feature requirements of enterprises and system integrators. The SipTone III is flash memory upgradeable for investment protection. The phone offers a robust design, excellent voice quality, a rich and intuitive user interface, and a comprehensive feature set typically available only in high-priced IP phones.

The integrated Ethernet switch on the SipTone III phone facilitates deployments within an existing office infrastructure because the phone can share an office LAN port with a PC or other computing equipment. Remote configuration and upgrade capabilities provide ease of management and reduce the total cost of ownership. Integrated Power over Ethernet (PoE) compatibility eliminates another set of wires to further enhance ease of use in an enterprise environment.

Key Benefits

- comparable in features to high-end, more costly phones (for example, PoE is available as a standard feature)
- cost-effective and user friendly implementation
- robust design with fully-tested, mature software
- remote configuration and upgrades
- Flash memory upgradeable design for investment protection

Key Features

VoIP

- Native support of SIP (RFC 3261)
- RTP Payload for DTMF Digits (RFC 2833)
- G.711 (a and μ law), and G.729A supported

Advanced Calling Features

- Two simultaneous call appearances
- Conference calling (with or without server assist; has on board mixer)
- Call hold
- Call waiting
- Call forwarding
- Call transfer (blind and consultative)
- Call return (*69)
- Caller ID
- Call waiting caller ID
- Redial
- Supports configurable dial plans

Enterprise Phone Functionality

- 3-port 10/100 Ethernet switch with 2 external RJ-45 jacks
- 802.3af compatible PoE support for modes A and B
- Handsfree full duplex speakerphone with volume control and excellent sound quality
- Headset jack
- VLAN support available Q1/06
- uLinux OS

User Interface

- Voice mail retrieval using the keypad
- Keypad dialing
- Speed dial from phone book
- Menu layout for easy navigation using LCD
- Tracking of missed, outgoing, incoming calls
- Busy and fast busy tones
- Volume control
- Ringer level control
- Eight function keys
- Four soft keys
- Five one-touch memory dial keys
- Menu/back button
- Conference button
- Speaker/headset button

Display and Indicators

- 132x64 pixels back-lit graphics display
- Message waiting indicator (MWI)
- Speakerphone and mute indicators

Size

- Height: 21.8 cm (8.6 in.)
- Width: 18 cm (7.1 in.)
- Depth: 7.1 cm (2.8 in.)
- Weight: 0.7 kg (1.6 lb)

Configuration, Management, and Software Upgrade

- Web server-based configuration and status check
- Autoconfiguration through TFTP across gateways
- Update phone book using the Web server
- Software upgrade through TFTP

Market Information

The ipDialog SipTone III SIP phone is positioned in the market as a feature-rich yet cost-effective SIP phone. The advanced features and the proven interoperability with Nortel Communication Server 1000 and MCS 5100 systems make it a winning solution for enterprises that seek the maximum use from their phone networks.

Ordering Information

For further information, contact the Nortel Select Product Program at (615) 432-4995 or select@nortel.com

Mediatrix

VoIP Access Devices and Gateways
IP Analog Gateway from Mediatrix



Overview

Mediatrix designed its analog units to protect customer investment in existing analog devices by connecting as many as twenty-four phones, fax machines, or modems to an enterprise VoIP network. For enterprise users, the devices provide simple, transparent, and cost-effective integration to an IP-based telephony infrastructure without discarding existing analog equipment.

Enterprises can use Mediatrix analog units to provide IP connectivity to legacy PBX or Key systems, either through analog CO trunk ports or through analog extension ports. Consequently, legacy system users can take advantage of VoIP benefits while preserving the investment in legacy phone systems.

Mediatrix analog units provide enhanced management capabilities with the Mediatrix Unit Manager Network, an SNMP-based element management system that provides remote management and configuration of a large base of Mediatrix units. Support for leading signaling protocols, high-compression CODECS, T.38 and QoS standards ensure that Mediatrix analog units provide a superior level of quality.

Ideal For

The Mediatrix is ideal for:

- Enterprises that want to migrate to VoIP but cannot justify the cost of a complete forklift approach.
- Enterprises migrating to VoIP that have an installed base of analog phones, faxes and modems, legacy phone systems, or IVRs that must remain in the VoIP environment for reasons of cost, functionality, or to retain user habits.
- Enterprises migrating to VoIP with small branch sites of 1 to 20 users.

Business Challenges

Consider the Mediatrix if you face the following business challenges:

- Are you considering migrating to VoIP but find that the business case is not attractive with a forklift solution because your base of legacy equipment is too costly to replace?
- Are you considering migrating to VoIP but have sites that need not upgrade to the functionality of IP phones (for example, warehouses, shipping docks, factory floors, dormitories, laboratories, retail outlets, or customer hotline phones)?
- Are you implementing VoIP and need to

connect your fax machines and modems to your VoIP network?

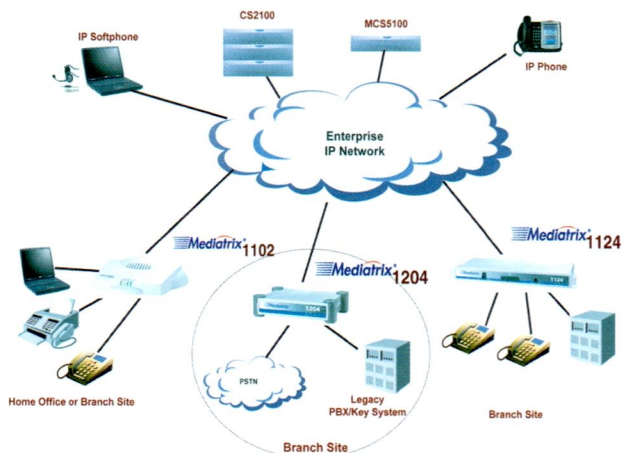
- Do you have branch offices that connect to the PSTN today and you want to reduce the recurring cost of telephone lines and intra-office long-distance charges?
- Are you considering migrating to VoIP solution but need to keep your existing IVR system to avoid changing local phone numbers or user habits?

Typical Applications

Typical applications of the Mediatrix include:

- Connect fax machines and modems to a VoIP network.
- Connect remote analog phones and fax machines to a VoIP network.
- Interface between a VoIP network and a legacy IVR system.
- Converge legacy telephone systems with an VoIP network.
- Connect customer hotline phones to a VoIP network.

Network Diagram



Key Points

- Provides an option for customers who do not want to change all equipment on their network.
- Allows enterprises to retain legacy equipment to improve the business case to implement VoIP.
- Offers a cost-effective option on a per port basis versus IP phones.
- Delivers PSTN-quality voice over IP networks.
- Is standards compliant.
- Offers SIP and MGCP deployment options.
- Is remotely manageable and upgradeable.
- Offers fax over IP support, including T.38.
- Provides multiple codec support.
- Provides QoS Support.
- Supports as many as 24 simultaneous calls regardless of codec used.
- Is available in FXS and FXO units.
- Provides PSTN Fallback on power outage or network failure.

Features and Benefits

Feature	Mediatix Analog Units
IP Telephony Protocols	SIP, MGCP/NCS (1100 Series only)
Telephony Features Supported	Caller ID, Call Waiting, Caller ID on Call Waiting, Call on Hold, Call Forward, Call Forward on Busy or on No Answer, Call Transfer with or without Consultation, 3-Way Conferencing Call Transfer with 3-Way Conferencing Consultation, Dynamic De-Jitter Buffer Manager, Voice Activity Detection in MGCP, over 280 telephony features and services supported
Vocoders	G.711 (A-law, μ -law), G.723.1, G.729a,ab
Echo Cancellation	G.168
Silence Suppression	Silence detection and suppression and Comfort Noise, Generation level software adjustable
Network Management Protocols	SNMPv3, TFTP, DHCP
Real-Time Transport Protocols	RTP/RTCP per RFC 1889 and RFC 1890, RFC 2833, RFC 3389
Ethernet Connection	1102: 2 RJ-45 connectors, 10/100 Base-T Ethernet access 1104, 1124 and 1204: 1 RJ-45 connector, 10/100 Base-T Ethernet access
Analog Connection	1102, 1104 and 2102: 2 or 4 RJ-11 connectors, analog phone/fax (FXS) interface 1124: 1 RJ-21X TELCO 25 pairs connector, analog phone/fax (FXS) interface 1204: 4 RJ-11 connectors, analog line (FXO) interface
Bypass Connection (1104, 1124)	1 RJ-11 connector, PSTN bypass
QoS	ToS, DiffServ, 802.1p, 802.1Q
Real-Time Fax	Group 3/Super G3 Fax real-time FoIP over clear channel (G.711) or T.38

Ordering Information

For further information, contact the Nortel Select Product Program at (615) 432-4995 or select@nortel.com

Mertek JCS Cable Assembly



Overview

The JCS Cable Assembly is a fully sheathed, prelabeled wiring system specifically for the Meridian 1 PBX IPE shelf. This cabling system effectively replaces the standard cables that installers use today. The JCS Cable Assembly has no screws to remove or individual cables to dress. One JCS Cable Assembly replaces eight standard 25-pair cables for the Option 61C-81C. Mertek also offers a JCS Cable Assembly for the Option 11C cabinet. Because of the unique design, each Option 11C cabinet needs one JCS Cable assembly instead of ten.

Ideal For

The JCS Cable Assembly is ideal for any Meridian 1 PBX installation—existing or new. New installations realize a more immediate benefit than do PBX expansions or relocations.

Business Challenges

- Do you want to save time and money on your installation?
- Do you want a professional, overall enhanced appearance for your Meridian 1 PBX?

Typical Applications

JCS CABLE ASSEMBLY M1 OPTION 61-81C

The Mertek cable assembly fits the right and left sides of the Meridian IPE module. Each cable is marked with the corresponding letters from the back of the IPE template. Each 25-pair binder is separated using standard color-coded markings.



JCS CABLE ASSEMBLY M1 OPTION 11C

The Mertek Option 11 cable assembly slides directly onto the base of the Option 11C cabinet. Before installation, the installer must first determine if the cable can run to the left or to the right. Remove the one screw on the back of the assembly and remove the small cover. Route the cable to the correct direction, replace the cover and install the JCS cable. Each 25-pair binder is separated using standard color-coded markings.

Key Points

- 1 JCS Cable replaces eight standard 25-pair cables for the Option 61C-81C.
- 1 JCS Cable replaces the standard 10 cables required per Option 11C.

Features and Benefits

- Save businesses 50 percent or more on labor and materials costs.
- Enhance the overall appearance of a Meridian 1 PBX.

Ordering Information

For further information, contact the Nortel Select Product Program at (615) 432-4995 or select@nortel.com

Qovia E911 Location Gateway Server

Overview

Employee mobility presents unique challenges in addressing E911 within the converged Enterprise. In an emergency, user location is critical to first responders and is often mandated by the FCC and local governments. The Qovia Location Gateway Server (LGS) and Location Information Server (LIS) help collect location data for IP clients connected to the Nortel Communication Server 1000.

Ideal For

Enterprises, government, and safety and first response agencies that have deployed, or want to deploy, a VoIP-enabled Nortel Communication Server 1000.

Business Challenges

Consider the Qovia Location Gateway Server if you face the following challenges:

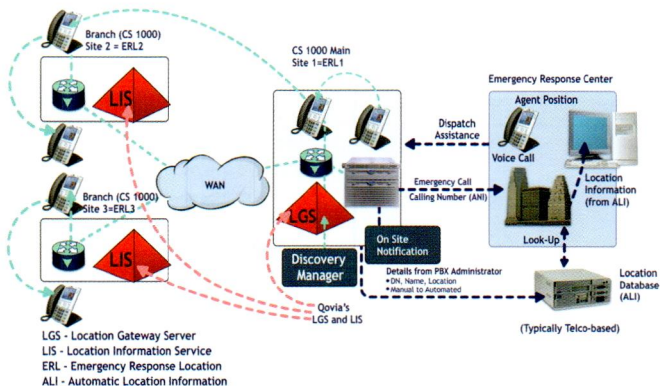
- Do your employees use IP-based clients, such as Nortel Mobile Voice Client 2050 or IP Client 2050 within your building?
- Do your employees move within your campus using Wireless LAN technology?
- Are your employees easily located within your building or campus when using IP phone clients?

- Does a first responder know how to find an injured or ill individual in case of an emergency?

Typical Applications

The typical customer profile for the Qovia Location Gateway Server is an enterprise or government agency that uses (as a pilot or full implementation) a VoIP phone system such as the Nortel CS 1000. Customers with several hundred to thousands of handsets are ideal candidates, as are customers whose phone systems are distributed throughout a campus or multisite corporate networks. Markets include Fortune 1000, government agencies, banking, finance, education, health care, and other vertical markets.

Network Diagram



Key Points

- Requirements that meet or exceed regulatory compliance with FCC rulings to provide E911 capability in IP and converged communications networks.
- Ensure employee safety and security by accurately identifying a location when an emergency call arrives from a Nortel IP Communications network and first responders are dispatched to the correct address
- Track the location of handsets, IP Clients, and other devices that are installed on, or residing within, the IP or converged network.
- Mediate potentially high costs associated with litigation from lawsuits that result from injury or loss of life because of IP sets cannot correctly terminate 911 calls to the PSTN E911 network.

Features and Benefits

- Improve employee safety by providing correct location for E911 responses.
- Realize the benefits of client mobility through VoIP without the risk of losing E911 support.
- Meet federal regulations requiring VoIP Phone systems be E911-capable and E911-compliant.
- Reduce handset or equipment loss by

keeping an up-to-date record of where phones are and which devices are attached to the network.

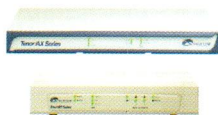
Market Information

In the United States, recently announced Federal Communications Commission (FCC) regulations mandate that Internet Service Providers (ISPs) and carriers support E911 call from IP sets. For mobile or nomadic IP sets, these regulations also stipulate that the service provider enable a method for the IP subscriber to insert specific location information. Some carriers and ISPs interpret this ruling to further apply to enterprise customers and require communications equipment vendors such as Nortel to provide the ability to track handsets connected to VoIP phone systems. The use of VoIP in an enterprise tends to meet these strict needs for E911.

Ordering Information

For further information, contact the Nortel Select Product Program at (615) 432-4995 or select@nortel.com

Nortel Orderable Compatible Product Quintum Tenor Multipath VoIP Gateway



Overview

Quintum offers VoIP switching and management solutions that install easily into existing Nortel Voice over IP (VoIP) network environments and always ensure quality and reliable voice calls.

The Quintum award-winning Tenor VoIP switches received widespread industry acclaim—including numerous Product of the Year and Best in Show awards—for their suitability for today's real-world voice and data environments. Tenor switching solutions are used worldwide in small to medium businesses (SMB), multinational enterprises, and service provider networks. Most importantly, Tenor switches remove the risk from VoIP deployment by providing the interoperability, failover, and performance features essential to VoIP success.

The Quintum Tenor Switch provides a branch office VoIP solution for the Nortel Communication Server 1000 (CS 1000). The Tenor delivers intelligent connectivity with the call server, traditional analog phones and the PSTN. If the Nortel call server loses connectivity, the Tenor continues to support interoffice calling and connectivity to the PSTN for all analog devices connected to Tenor.

Ideal For

Enterprise businesses deploying VoIP Services in the branch or remote office that require analog connectivity to the PSTN with advanced connectivity to the Nortel CS 1000 solution. The Tenor provides connectivity of analog devices, local PSTN support and call routing functionality, and survivability if the IP Network fails.

Business Challenges

Consider the Quintum Tenor if you face the following business challenges:

- Do you need to easily integrate analog devices into the IP telephony network at the branch site while providing survivability to the PSTN?

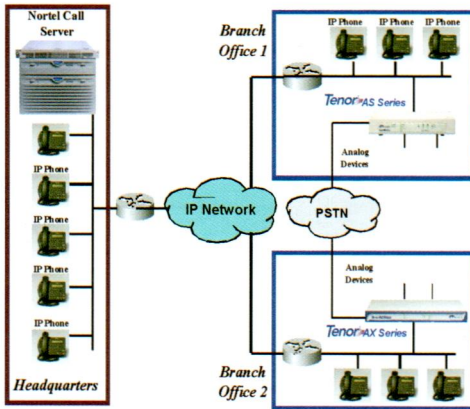
Examples of analog devices include, fax machines, alarms, paging systems, cordless phones, and traditional analog phones.

- Do you need to provide local PSTN connectivity for local inbound calls offering branches local presence and for local outbound to save on toll charges?
- Do you need to support emergency services at the branch such as 911?

Typical Applications

Many Enterprise customers want to deploy the Tenor at a branch to support local PSTN service and integrate analog devices that are critical to business processes.

Network Diagram



Key Points

The Quintum Tenor provides:

- connectivity support for local analog devices
- local PSTN Presence and Local Outbound PSTN connectivity
- survivability for analog devices at the branch offices

Features and Benefits

The Quintum Tenor switch delivers an effective branch office VoIP solution for the Nortel Communication Server 1000. The Tenor unique MultiPath architecture provides intelligent call routing and complete support for the branch office networking including:

- connectivity between the PSTN and the Nortel Communication Server 1000
- connectivity between analog phones and fax machines and the Nortel Communication Server 1000
- PSTN hop off and hop on

Tenor switches offer FXS and FXO connections in addition to a VoIP interface to the IP network. Nortel Communication Server 1000 users can build a flexible VoIP network. In addition to providing traditional analog phones and fax machines full access to the Nortel Communication Server 1000 network, the call server can access the remote office PSTN network for local calls.

The Nortel Communication Server 1000 can route calls from IP phones and analog devices over the IP network to a Tenor at another location, where the calls can then hop off onto the PSTN. Nortel customers can achieve maximum cost savings by using the corporate network to bypass long distance and international toll charges. The Tenor also enables calls from the PSTN to hop on to the VoIP network and route to the appropriate endpoint (whether an IP phone or analog device) anywhere on the network. This feature is beneficial for remote and mobile users. Access authorization to the VoIP network from the PSTN uses internal Tenor IVR prompts and PIN codes.

In combined Nortel and Quintum environments, the call server provides the Nortel feature set to IP phones and provides key call-processing and calling features for analog phones. If the branch office loses connectivity to the Nortel Communication Server 1000, the Tenor ensures that all calls from analog devices connected to the Tenor complete by automatically routing all calls over the PSTN network. Tenor switches therefore radically reduce the risk of VoIP deployment.

The Tenor integrated gatekeeper functionality provides an additional level of reliability. This gatekeeper is configurable as a secondary gatekeeper to support the VoIP network. If Nortel Communication Server 1000 loses connectivity, the Tenor gatekeeper takes over the call processing for the Tenor analog endpoints. The VoIP network then remains functional between all the branch offices for calls from the analog phones connected to the Tenor. The analog phones support basic calling functions, and all connectivity provided by Tenor switches continue uninterrupted.

Where Tenor switches support multiple branch offices, the analog phones and fax machines connected to the Tenors take advantage of the unique features of Tenor for communication between those offices. These capabilities include:

- **Real Time QoS Switching**

SelectNet can monitor the quality of all VoIP calls between Tenor switches. If the quality of the call becomes threatened by IP network impairment, then the call can be transparently switched in mid-call to the PSTN.

- **Easy co-existence with NAT**

Many VoIP switching architectures have difficulty in environments where network address translation (NAT) is used on network firewalls. The Tenor NATAccess feature makes it easy to implement a secure VoIP network in these environments.

- **Optimum bandwidth efficiency**

Unique PacketSaver technology lets Tenor switches multiplex VoIP packets to reduce bandwidth use by up to 57 percent.

- **Full H.323 and SIP compliance**

Tenor switches support and interoperate with a wide range of standards-compliant third-party products.

The completeness, ease of ownership, and reliability of Tenor make it the ideal solution for a remote office. Nortel customers can build a reliable, high-performance VoIP network, whether they connect a few buildings on a campus or dozens of locations around the world.

Ordering Information

For further information, contact the Nortel Select Product Program at (615) 432-4995 or select@nortel.com

Real Time Monitors Reporting

Overview

Real Time Monitors' flagship product, Switch Expert, completely automates the collection, processing and reporting of PBX Operational Measurements (Traffic), System Events (Alarms) and Simplified Message/Call Detail Recording (Billing) data for customer networks containing Meridian SL-100 (SL-100), MG 1000M, Communication Server 1000, or Meridian 1 PBX systems. Switch Expert offers great value to Nortel customers by providing on-site maintenance and administration personnel with a tool to evaluate network performance and usage through a powerful and easy to use graphical user interface.

Ideal For

The primary target market for Switch Expert is any organization that maintains a mixed network of Nortel communications platforms, including SL-100, MG 1000M, Communication Server 1000, or Meridian 1 PBX systems. Target customers include but are not limited to universities, hospitals, commercial, state and federal governments and military, as well as service providers for such customers.

Business Challenges

- Do you need to monitor System Events and product Operational Measurements for networks containing a mix of Nortel systems such as SL-100, Communication Server 1000 and MG 1000M?
- Do you need to extract, consolidate and report on CDR for disparate Nortel communications platforms within your network?
- Do you want a single solution that simplifies administration of multiple Nortel communication servers?

Typical Applications

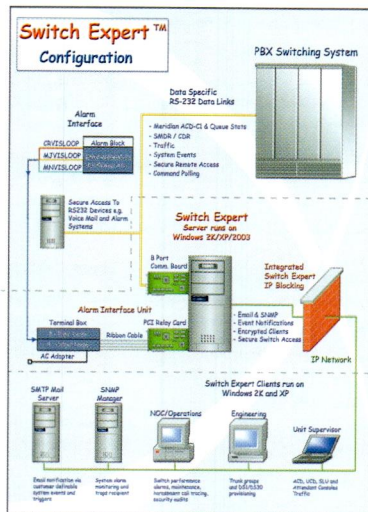
Switch Expert (SE) is an IP based client/server network element monitoring application that uses AES-128 strong encryption and meets the Telecommunication Management Network (TMN) mandatory requirements. Switch Expert is used by the Network Operations Center (NOC) to simultaneously monitor multiple network elements (NE) in real-time and provide

point-and-click access to SMDR/CDR, system events, and traffic analysis reports. SE provides short- and long-term traffic-trending statistics essential to properly provision trunk groups, lines modules, and remote switching sites.

Switch Expert may be configured in a parent/child relationship; this configuration enables the SE children to relay locally processed SMDR/CDR and system events to its parent. If network connectivity is lost between the SE parent and child, the child will automatically operate in a fully functional standalone server mode until the network resources are restored. Upon restoration of the network services, all locally buffered child data is synchronized automatically with the SE parent server. In addition to monitoring all system events, SE monitors and detects loop contact closures from external devices, such as system alarm status, environmental alarms, and switch room access.

Switch Expert includes functionality that allows the application to process MSL-100, MG 1000M, Communication Server 1000, and Meridian 1 PBX Operational Measurements (OMs), System Events (LOGS), Station Message/Call Detail Recording (SMDR/CDR), System Alarms, and other key features.

Network Diagram



Key Points

- fault management system
- automated traffic report delivery system
- easily query and analysis of the PBX system
- powerful and easy-to-use point-and-click interface to multiple PBX systems
- easily monitor and access multiple systems simultaneously
- PBX access through an AES 256-bit or SSH secure client
- identification of cost savings through trunk provisioning analysis
- toll fraud detection and notification process

Features and Benefits

- **Station Message and Call Detail Recording (Billing):** Provide real-time tracing of all completed calls using a powerful Report Wizard. Trace individual station use, authorization-code use, emergency situation calls (911 in North America), bomb threat, and harassment calls. The wizard searches through 1.5 million records per minute. This automated process replaces manual, time-consuming, and error-prone procedures that can take days or weeks to complete.

- **Operational Measurements (Traffic):** For MSL100 systems, SE provides Announcements (ANN), Automatic Call Distribution (ACD), Conference Circuits (CNF), Office Traffic (OFZ), Uniform Call Distribution (UCD), Attendant Consoles (ATD), Switch Performance Monitoring (SPMS), Virtual Facility Groups (VFG), Hunt Groups (HNT), Remote Call Forwarding (RCF), Subscriber Line Usage (SLU), Line Modules (LMD), XPM Link (XPM) and Trunk Traffic (TRK). Switch Expert provides compiled traffic reports to ACD and console supervisors along with long-term traffic statistics essential to properly provision trunk groups, lines modules, and remote switching sites. For Communication Server 1000 and Meridian 1 systems release 24 and higher, SE processes all TFS, TFC, and TFN reports to include trunk and attendants console reporting.
- **System Event Monitoring (Alarms):** Provide structured access to all log events generated by a telephone system (for example, IBN110 Auth Abuse, LINE115 and LINE117 Calling Line Identification [CL], and LINE125-136, Malicious Calls Trace [CLF]) and features an e-mail and SNMP notification process.

- **Command Line Polling (CMD):** For MSL100 systems only, CMD provides a way to poll the secret log using the logutil OPENSURET commands. This process records all commands entered into the MSL100 system by maintenance or service order personnel. This feature also detects hackers attempting to access the MSL100 system.
- **Secure Switch Access (SSA):** Provide authorized clients switch VT emulation access through the Switch Expert server.
- **Report Scheduler (RPT):** Schedule Traffic, System Events, and SMDR/CDR reports and produce the output in HTML, XLS, PDF, and tabbed text. These reports are automatically sent by e-mail or FTP to their desired destinations.
- **Station Message/Call Detail Recording (SMDR/CDR) Real-Time Redirect:** The Switch Expert parent collects SMDR/CDR records from all children and redirects them to the billing server based on customer-definable dialing parameters. Switch Expert can record all calls, for example, Trunk-Line, Line-Line, Trunk-Trunk, and Line-Trunk, and redirect only the toll calls to the billing server using FTP, RS232, or TCP client/server network connections. The redirected records can be the original raw ASCII data produced by the PBX or the data can be reformatted into tabbed delimited records with customer-definable fields.
- **Enhanced Map (MAP):** Centralized clients have visual alarm indications and point-and-click access to multiple sites with seamless alarm filtering.
- **System Event Analyzer (SEA):** SEA provides point-and-click analysis of thousands of critical, major, and minor system events. Switch Expert analyzes similar events based on selectable text within the events.
- **System Alarm Management (SAM):** SAM provides hardware alarm monitoring and notifications. The hardware alarm monitoring is accomplished using an optionally provisioned PCI relay card installed into the SE parent or child servers. The PCI relay card provides eight incoming and eight outgoing definable loop contact closure points. Contact closures can be assigned Critical, Major, or Minor alarm severity.
- **Toll Fraud Monitoring (TFM):** TFM provides notification of simultaneous or abusive authorization code use along with excessive or unusual domestic and international calls, such as long duration and unexplainable tandem calls.
- **E-mail and SNMP notifications and paging:** based on definable System Event, Hard Alarm, and Toll Fraud triggers.
- **AES 128-bit:** strong client/server encryption.

Market Information

Currently, Switch Expert is deployed at 75 percent of INSIGHT-100 sites along with numerous military and government installations making it the standard application used by maintenance and operational personnel in these vertical markets.

Ordering Information

For further information, contact the Nortel Select Product Program at (615) 432-4995 or select@nortel.com

Nortel Orderable Compatible Product Soft-ex Call Management Solutions

Overview

Soft-ex is a leading supplier of Voice Management Solutions and is verified by Nortel for:

- SwitchMinder—Voice Security
- RingMaster—Call Management
- RingMaster Lite—Call Management for SMEs with Nortel BCM50

SwitchMinder offers security critical functionality that detects, alerts, and controls internal and external telecommunications fraud. SwitchMinder reduces inherent financial and operational costs associated with toll fraud activity. As fraud activity usually takes place when you least expect it, this dynamic voice security information is pushed out proactively, when the infringement occurs.

Soft-ex RingMaster delivers optimal tools to control costs and effectively manage of the customers' telephone system. Business-critical data, collected from a single PABX, an IP switch, or a global network, provides complete visibility on cost control and budgeting, incoming call handling and customer service, traffic and network load management, and Quality of Service using IP.

RingMaster Lite is an innovative call-management solution integrated to the Nortel Business Communications Manager 50 (BCM50) for small and medium businesses. Ringmaster provides a high-quality solution for organizations that want an easily installed, user-friendly, and competitively priced product. Ringmaster presents business-critical information in an easily understood format so that you can devise sound strategies to reduce telecommunications overhead. As many businesses have already discovered, RingMaster Lite generates a quick and tangible ROI.

Ideal For

Traditional voice PABXs and IP PBXs of all sizes can use SwitchMinder and RingMaster. Both products are suited to medium and large companies with stand-alone or networked systems across all markets.

RingMaster Lite is suited for BCM50 customers with a single site and who require a cost-effective call management solution for an environment with less than 50 ports.

Business Challenges

SwitchMinder

- Do you need to protect your organization against external toll fraud and hacking?
- Do you have a proactive alerting system to notify the right people in real-time about an infringement or irregular call activity across your voice network?
- Can you identify whether large costs arise from dialing international numbers or mobiles using

voice mail and maintenance ports where default passwords remain unchanged?

- On average, are you aware that 25 percent of calls made by staff during working hours are not business related?
- Despite achieving cost savings for remote workers, have you investigated the probability that you have more risk and inherent costs using trunk-to-trunk access?
- Do you know what the implications are to your voice security infrastructure with IP?
- Do you need to exercise a clear and definitive communications strategy to control adherence to corporate security policies and thereby improve network infrastructure and employee productivity?

RingMaster

- Do you want to know how to control the rising costs of telecommunications?
- Do you need to improve the efficiency and operation of your PBX and IP network?

- Do you know when callers wait too long, transfer between departments, or end up in voice mail resulting in lost sales opportunities?
- Do you have accurate information to check the accuracy and cost effectiveness of carrier bills?
- Have you visibility on sales and marketing inbound and outbound activities?
- Do you require a way to measure Quality of Service (QoS)?

RingMaster Lite

- Do you require an SME-tailored solution to address the needs of call management?
- Do you need an easily installed, user-friendly solution?
- Do you want to generate key reports on call cost and duration, by date, extension, and number dialed?
- Can predefined filters with simplified multidimensional views that can drill down to individual call activity assist in your cost control?

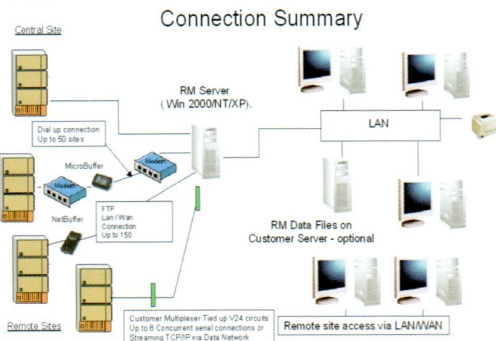
Typical applications

- Proactively analyze and report on all calls made according to security criteria.
 - Push alarms by e-mail or text to the relevant people to take timely action on fraud or unusual traffic patterns in near real-time.
 - Reduce telecoms calls costs significantly.
- Proactive monitoring of call costs and activity

decrease this expense from 10 to 30 percent by reducing misuse and abuse and limiting toll fraud.

- Implement a user-friendly and cost-effective solution to limit financial exposure to toll fraud and reduce internal misuse and abuse.
- Implement a secure application running on both PBX traditional networks and IP networks.
- Have an alert mechanism based on QoS to analyze and report on the quality of voice calls for packet loss, jitter, latency, or bandwidth use.
- Analyze statistics on answered and unanswered call ratio and ring times.
- Classify calls based on business and personal and charge back accordingly.
- Report on lost calls by department; that is, how many calls end up in voice mail and why or from where do support calls come.
- Monitor Sales team activity by reporting by sales person the number of calls made, to where and for how long.
- Monitor Support division to establish whether training is required if support calls lengthen.
- Manage trunk configuration better; that is, change trunk configuration to allow more incoming calls during peak periods for improved customer responses.

Network Diagram



Key Points

- Limit financial exposure to toll fraud.
- Immediate detection and warning of potential fraud by e-mail or text.
- Flexible, user-defined detection parameters.
- Assists in reducing overall telephony spend by 10 to 30 percent.
- Highlights excessive ring time alerts and implications for customer service.
- User-friendly, browser-based console enables remote operation.
- Interfaces with legacy and IP PBXs or a mixture.
- Extensive and highly flexible reporting options on call cost and duration; by date, extension and number dialed; based on response times and traffic analysis.
- Manages incoming, outgoing, tandem and internal traffic, providing real time analysis of all calls.
- Supports multiple carriers, tariffs and languages across EMEA, which can be updated online.
- Available for stand-alone sites and centralized call management in a networked environment.
- Online training and full help desk support available.

Features and Benefits

SwitchMinder

Internal and external telecom fraud is now estimated to cost businesses worldwide €60 billion per annum and is increasing at a rate of 15 percent every year. The result is an increase in unexpected costs, compromised security infrastructure, and reductions in staff productivity.

- Soft-ex SwitchMinder is a leading Voice Security solution that continuously checks for fraud by analyzing call data activity.
- Sensitive, user-defined detectors immediately identify potential fraud and send a warning to a specified person within the organization.

RingMaster

RingMaster produces a range of cost reports (including a list of the 50 most expensive calls by extensions, the most frequently dialed numbers and calls with the longest duration and response

times). The reports can pinpoint high cost areas and identify the possible misuse of telephone services—dramatically reducing your overall telecommunications costs. You can also increase accountability by allocating costs directly to departments and extensions, even at remote sites.

Customer perception is dramatically affected by the length of time it takes for staff to answer incoming calls. Response time reports (based on time, day, date, and length) measure and accessibility to customers and other callers.

Use these statistics for the following tasks:

- Set targets for call handling.
- Manage operator staffing levels to match daily traffic patterns.
- Monitor incoming call response times in customer-facing departments.
- Manage help desk performance and efficiency.
- Trace calls across the network to evaluate inbound ring time to first answer point.

Maximize efficiency with leading-edge software

RingMaster alleviates the challenges of minimizing costs and ensuring maximum service availability while benefiting from optimal PBX or IP network performance.

Soft-ex reports show the amount of traffic carried by the PBX and its associated incoming and outgoing lines, so that you can achieve the best possible trade off between cost and service.

- Identify under-used extensions that can be used to meet demand for additional resources
- Identify surplus trunks where customers are paying rental for unused lines
- Identify areas where there are insufficient lines to meet busy period demands
- Plan network capacity to meet a target Grade of Service and report on Quality of Service for jitter, latency and packet loss to optimise your IP environment.

RingMaster Lite

- User friendly and competitively priced solution
- Cost control and reduction
- Cost reports, who-where-when
- Analysis of spend and trends

- Reduction in staff personal use
- Improved customer service
- Missed calls with CLI
- Busy periods capacity checks and improvements

Market Information

Soft-ex provides innovative solutions to optimize Voice Security and Call Management for Nortel customers. Soft-ex is a market leader in this specialized niche with the SwitchMinder and RingMaster products installed worldwide across all industry vertical markets, providing Nortel clients with high quality solutions. With over 15 years of expertise, Soft-ex has a proven track record of enabling business-critical data collection and delivery to generate a complete picture of network activity for cost control and budgeting, internal and external fraud detection, incoming call handling and customer service, call classification, traffic and network load management and Quality of Service over IP.

Ordering Information

For further information, contact the Nortel Select Product Program at + 44 2890 36 3665 or SPP_EMEA@nortel.com.

Symon Enterprise Server

Overview

Symon Enterprise Server (SES) is a real-time middleware application that provides high impact visual messaging, reporting, and alerting solutions to unify Nortel contact center data and other Key Performance Indicators (KPIs). SES collects, distributes, and reports real-time and historical data for all major platforms used by today's contact centers. SES combines technology, information, and communication to eliminate data silos and to reduce operating costs while increasing productivity and performance.

SES Highlights:

- **Wide Array of prebuilt input collectors** for easy point-and-click integration to Nortel Contact Center Manager Server (CCMS), Nortel Symposium Express Call Center, and Nortel Business Communications Manager (BCM).
- **Snap-In data interfaces** for rapid deployment using toolkits including on-demand detailed views of predefined canvasses.
- **Multisite, multivendor, multiplatform and multidatabase consolidation for contact centers** reporting for ACDs, dialers, CRM, IVRs and HelpDesk applications and more
- **Scalable** so businesses can start small and grow the Enterprise Real-time Data Fabric. Expand to an unlimited number of data sources and display media end points.
- **Use graphics and full-motion video** for corporate and employee communications and in-seat agent training.
- **Display Options:**
 - **Agent Scorecards** deskview offers pop to top, threshold agent alerting and statistics.
 - **Business Dashboards** Vista Web Pages, an application for creating custom templates and predefined CCMS and SECC canvasses for real-time and historical Web-based reporting.
 - **IP Wallboards** with 802.11 wireless options.
 - **Large plasma and LCD screens and TV monitors** through Design Studio software.
 - **Other output** sing PDAs, e-mail, and more

Ideal For

Real-Time Performance Management in Contact Centers

With the Symon suite of products, call center managers can have an up-to-the-second status of call queues, wait times, stations manned, and available and average call times—information that was previously unavailable or difficult to access.

Symon solves problems for organizations that need:

- **Visual alerting and messaging**
The Symon wireless, IP-enabled NetLite II wallboards and TargetVision solutions work with the DeskView product to enable messaging and alerting onto public visual displays such as wallboards, monitors, or the desktop. Symon TargetVision provides a rich video-based

solution for displaying real-time information to plasma and television displays.

- **Real-time reporting**
Many contact centers find themselves using products from different vendors to achieve one goal. Typically, point solution products provide reports only for data generated within their own product; consequently, reports can lack context about other key metrics on which their department is judged. Managers sometimes must combine and analyze from multiple reporting packages, none of which can deliver a unified view of their contact center. Symon Vista can help achieve that.
- **Agent Scorecards and Business Performance Management**
Standard reports are not always sufficient. The next generation of reporting requires more than

platform-specific reporting; it requires enterprise-wide views of technical and business data. For example, agent data such as calls handled and time in wrap-up is useful. Agent data and information about generated revenue is even better. Vista delivers this functionality.

- **Executive Dashboards**

Use Symon to align activity with strategic goals because you now have access to the right data and a standard presentation platform called Vista for all users. The major benefit is that key decision makers now have complete vision into all operations across the enterprise and potentially into suppliers and customers.

- **Historical Data Management**

Use Symon DataStore to collect, consolidate, and transform data when existing systems do not provide the exact required data. Use DataStore to collect real-time data, normalize the data across disparate platforms, and store the information for accurate historical reporting.

Employee Communications

With the acquisition of TargetVision by Symon, SES is the only solution with integrated shrink-wrapped real-time data collection, streaming video, news feeds, and custom corporate and employee communications. Multiple formats are available for the presentation layer including LED displays, plasma displays, television displays, PDAs, cell phones, and desktop views. Symon is a world leader in corporate visual performance and productivity management, alerting, messaging, and crisis communication.

Use TargetVision to:

- Increase productivity through instant employee awareness.
- Empower employees to make timely, informed decisions.
- Communicate consistently to all shifts and locations.
- Recognize top individual and team performers.

- Communicate critical performance data.
- Fortify crisis communications strategies.

The Supply Chain and Manufacturing

The Supply Chain and Manufacturing is the lifeblood of many companies. As a manufacturer, Symon understands the critical nature of the activities of manufacturing plants, distribution facilities, and warehouses.

Information, good or bad, must travel fast to ensure immediate corrections to avoid incurring potentially excessive costs. The production line that creates defective parts or the distribution center that remains unaware of changes in a large order can have operations problems. Symon specializes in real-time communications to provide solutions to help you minimize costs, avoid miscommunication, and improve productivity.

Business Challenges

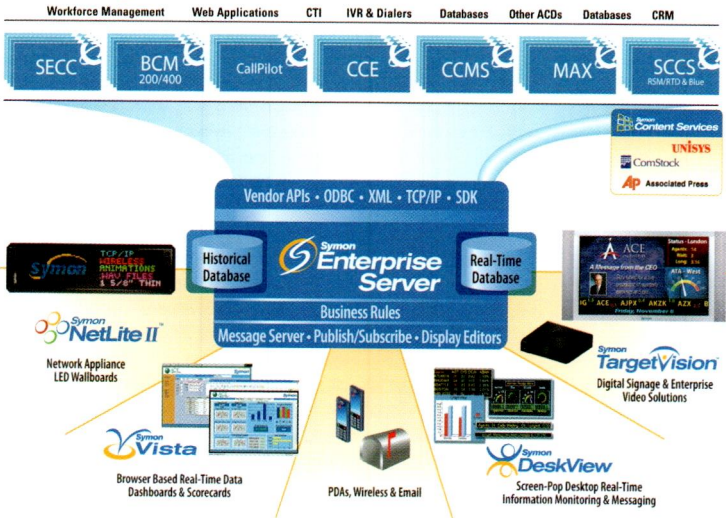
Consider the SES if you face the following business challenges:

- Do you have difficulty seeing a complete view of your single or multisite contact center?
- Do you want to view your contact center from a Line of Business perspective rather than from queues or skill sets?
- Do you want to see information from different database types on one screen to run your business effectively?
- Do you want to incorporate different media types such as video, slide shows, and real-time data on a plasma or LCD?
- Do you want to communicate with employees in multiple ways such as instant messages to desktops, corporate updates to TVs in break rooms and lobbies, and threshold alerts to PDAs and cell phones?
- Do you want to use new venues for employee enrichment such as "In-Seat" Agent Training?

Typical Applications

Symon solutions are found most often found in Network Operation Centers (NOC), Call Centers, Help Desks, Supply Chain Distribution and Manufacturing sites where real-time information is displayed on wallboards, plasmas, LCDs, or desktops.

Network Diagram



Key Points

- advanced data manipulation and distribution capabilities
- wide array of end points supported (including applications, mobile communications devices, desktops and enterprise data display devices)
- extensive set of prebuilt data collectors (including CCMS and CCE)
- open XML interface enables integration of unique or proprietary applications into the real-time infrastructure
- flexible data output with either a messaging approach or a publish and subscribe interface
- event interface can initiate workflows or scripts in your CTI and workflow software
- high-performance in-line memory database

Features and Benefits

Using Symon's open standards and prebuilt integrated solutions leads to:

- reduced complexity
- faster time to operation
- lower total cost of ownership
- flexibility to incorporate custom applications
- reliability and scalability
- investment protection
- rapid return on investment

Market Information

- Symon Enterprise Server (SES) received its second Call Center Magazine Product of the Year Award. This award, presented at the Call Center and Demo Conference in Dallas, Texas for 2004.
- Symon Enterprise Server (SES) received the prestigious Best of Show Award for Reporting Tools at the 2004 International Call Center Management Conference (ICCM) in Chicago.
- Symon TargetVision Enterprise 3.0 visual communications system received Media & Methods Magazine 2004 Awards Portfolio Product of the Year.
- Installed in more than 6000 organizations worldwide, more than four million clients view Symon products daily. Symon has provided award-winning products since 1981.

Ordering Information

For further information, contact the Nortel Select Product Program at:

North America - (615) 432-4995 or

select@nortel.com

EMEA - + 44 2890 36 3665 or

SPP_EMEA@nortel.com

Nortel Orderable Compatible Product

Teleopti Contact Centre Solutions

Overview

Teleopti Contact Centre Solutions (CCC)—Workforce Management (WFM) with a human touch. The key to success is to regard workforce management as an ongoing process, not an interchangeable product. Effective WFM has no “use by” date—in short, it requires constant development. The objective is to continually create high cost-efficiency while maintaining strong staff commitment.

Teleopti CCC, combined with the Nortel Contact Center Manager Server (CCMS), effectively takes parameters such as skills, contact channels, opening hours, local market labor laws, customer requirements, and agents preferences about working hours, and combines them into one strong service operation. The key word is proactive, which means a more cost-effective contact centre.

Superior flexibility in forecasting and scheduling, considering European work time directives, guarantee optimal resource management. With features like real-time adherence, holiday planning and Web-based tools for all levels of the organization, Teleopti CCC helps improve customer service while reducing staffing cost and employee turnover. Management focuses more on strategy and less on day-to-day tasks. Agents are empowered, which results in increased satisfaction and motivation through preference and performance tools.

Teleopti 6.0, combined with Nortel Communication Server 1000 (CS 1000), provides controlled conversion and management of all IP, fixed, mobile voice calls, and all voice services. It provides total quality, cost, and security control over one of your company's most vital resources and enables immediate and Web access to complete and enhanced knowledge about IP and IT costs.

Ideal For

The customer profile for Teleopti CCC products and services is a contact center or customer service (inbound or outsourcing) in any vertical of the market that wants to optimize their workforce management combining:

- Management demands for efficiency and profitability
- Customers demands for service and quality
- Employees demands for attention and participation in decision making.

Teleopti CCC is suitable for contact centers in any market vertical including banking, insurance, telecommunications, travel, energy, and the public sector.

Teleopti 6.0 is the complete solution that fully supports Telecom and Net Managers, Security

Managers, Quality Control Managers, and IT Controllers in their work to ensure cost, security, and quality control in the organization. Teleopti 6.0 is the perfect tool for large consumers of telephony, for example, large organizations, municipalities, governmental institutions, and operators.

Business Challenges

Teleopti CCC

- Do you meet your service targets and are your service levels consistent?
- Can you control retention rates?
- Do you know how many resources you need to meet customers demands at a particular time?
- Is your contact center viewed as a profit center?
- Is your organization aware of cost and productivity drivers for your contact center?

Teleopti 6.0

- Can you dynamically simulate the effects on IP and or mobile conversion?
- Can you simultaneously manage mobile call costs and fixed voice costs?
- Can you manage call quality issues all across the organization?
- Can you manage deviations, trends and voice security aspects?

Typical Applications

Teleopti CCC is particularly beneficial for customers whose contact centers are growing from fifty to several thousand seats. Planning resources in a multiskill and multisite environment in combination with various work-time legislations and individual needs is where Teleopti CCC brings automation and provides the most cost-effective resource management.

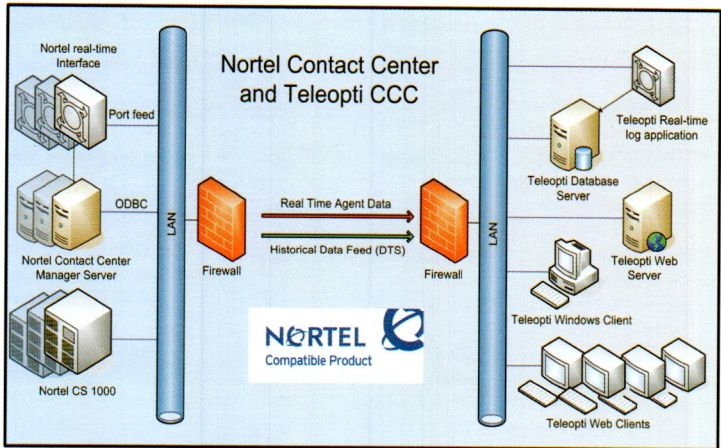
Teleopti 6.0 is a suite of completely Web-based management tools that enables one to look ahead, to see trends, to improve customer service, to simplify administrative processes, and to save costs.

Teleopti 6.0 is the single solution to handle all volume, quality, and cost monitoring for fixed and mobile telecom and data communications as well as costs for equipment and services that also enable digital invoicing.

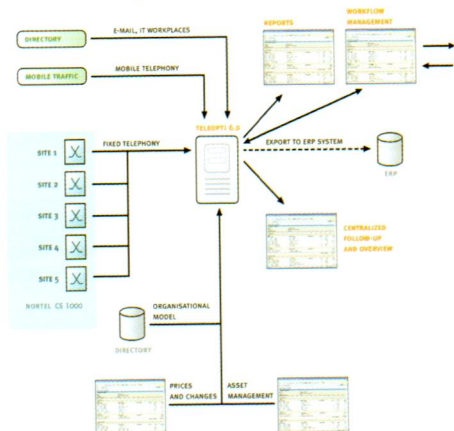
Teleopti 6.0 enables mobile asset management as well as traditional line and extension management to ensure that Teleopti 6.0 optimizes your company telephony now and in the future.

Network Diagram

Teleopti CCC Network Diagram



Teleopti 6.0 Network Diagram



Features and Benefits

Teleopti CCC

- dynamic multiskill, multichannel forecasting and scheduling.
- Superior long-term forecasting.
- Virtual contact center planning.
- Superior flexibility taking into account labor legislation.
- Scheduling of all contact center activities including back-office.
- Intraday rescheduling.
- Extensive Web-enabled analysis tools.
- Simulation and cost benefit analysis.
- Industry-leading work time preferences.
- Improve revenues with optimal resource management.
- Involve all levels of the organization.
- Improve your customer service while reducing staff costs.
- Boost agent satisfaction and motivation through preference and performance tools.
- Allow management to focus more on strategy and less on day-to-day tasks.
- Choose their language.
- Maximize return on investment in advanced multiskill, multisite contact center solutions by using industry-leading workforce management tools.

Teleopti 6.0

- Complete Support for multisite and meshed networks, IP, voice, mobile
- One centralized open database, 100 percent Web-accessed modules.
- Automatic import links with organization directories
- Automatic logging links with most PBX systems
- Automatic export links with most ERP systems
- Standard and detailed reports
- Web-based order system for MACS

Key Points

- By providing an up-to-date and accurate picture of telecom-related consumption, quality, and assets, any organization can reduce costs, improve the customer service, and automate administrative work.
- The system is modularized and easily customized to suit the specific needs of any organization.

Market Information

Teleopti won the contact center industry top award for Best Workforce Management in the 2005 ContactCenterWorld.com Members Choice Awards. Teleopti won the awards for Best Workforce Management solution in Europe. These awards are unique as users vote for the winners judging panels.

Ordering Information

For further information, contact the Nortel Select Product Program at +44 2890 36 3665 or SPP_EMEA@nortel.com

Unique Communications CAIRS OSS

Overview

CAIRS OSS offers a simplified network-level provisioning management solution to administer an MG 1000M remote system from the Meridian SL-100. MG 1000M consists of the Meridian 1 PBX or a CS 1000 system. CAIRS OSS provides a single interface to provision and manage these switching systems across an enterprise network.

Ideal For

The primary target market for the Unique Communications CAIRS OSS network management platform is large network owners that manage multiple Nortel switching systems and PBX. This includes companies or organizations that have both MSL-100 and CS 1000/Meridian 1 PBX. Many industries, including federal and local governments, health care, education, and corporations, currently benefit from the CAIRS OSS

Business Challenges

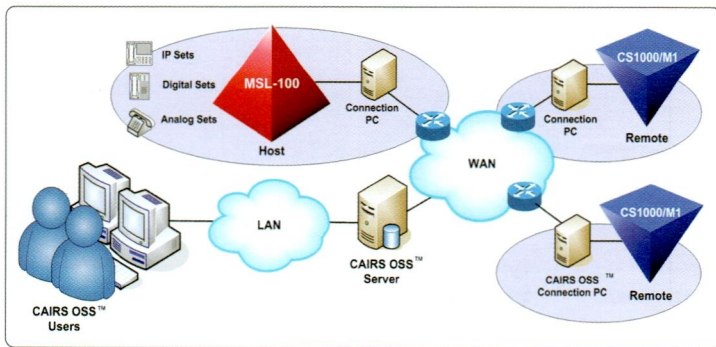
While most Network Management Systems offer expertise on a particular Nortel platform, CAIRS provides expertise for MSL100, CS 1000, and the MG 1000M systems. CAIRS simplifies management by providing an identical provisioning interface for both switching platforms and all network assets (IP, digital, and analog). Maintaining multiple Nortel platforms can be expensive and timely. Nortel offers the CAIRS OSS application to eliminate

unnecessary expenditures and resources required to manage Nortel communications platforms. CAIRS reduces network management effort by offering a single provisioning interface for time-consuming and tedious provisioning tasks. Through an easy-to-use graphical interface, CAIRS streamlines provisioning for multiple switching platforms and multiple set types (IP, digital, ISDN, and analog) into a single screen. To ensure complete database synchronization, CAIRS downloads the switch databases nightly, and runs database comparisons to find discrepancies between the CAIRS database and the switch database.

Typical Applications

CAIRS OSS provides a powerful solution that requires an NMS to manage network activities in complete network environments. Activities include moves, additions, changes (MAC), workflow, help desk, subscriber billing, infrastructure tracking, and inventory management. CAIRS OSS is a scalable solution for all organization types and sizes.

Network Diagram



Key Points

- Reduced effort for multiplatform management.
- Provides asset and inventory knowledge required for purchasing and project planning decisions.
- Increased opportunity for nontechnical personnel to complete technical tasks and job requirements.
- Pre-configure set feature templates.
- Automate work flow traffic between work groups for work orders and trouble tickets.
- Real-time switch connectivity.
- OSS Database – Switch Database Synchronization.

Features and Benefits

- **Single Provisioning Interface for the MSL100, Communication Server 1000, and Meridian 1 PBX**

CAIRS offers a simple but powerful solution for complex, time-consuming, and tedious provisioning task. Through an easy-to-use graphical interface, CAIRS streamlines the management of complex networks containing multiple switches and multiple set types (IP, digital, ISDN, and analog). CAIRS determines when the system changes the switching platform. The system can provision the switch real-time at the end of a large work order, or run at scheduled times and dates. To ensure database synchronization, CAIRS downloads nightly the switch database to highlight discrepancies between the CAIRS database and the switch database.

- **Graphical Provisioning Interface**

The Graphical Provision Interface offers a configuration tool to create set templates that manage feature packages, physical buttons, software buttons, and virtual features.

- **Intelligent Feature Management**

Managing Set and Key features requires system knowledge and expertise. Each feature can require additional dependent features or additional information to function correctly. CAIRS removes the difficulty of assigning features from the provisioning process. CAIRS

automatically adds dependent features to configured sets to eliminate the need for users to memorize long lists of features that require other features to function. When a feature requires more information to function correctly, CAIRS guides the user through an information gathering process until the assignment is complete.

- **Electronic Work Flow Management**

CAIRS provides a complete workflow management system for enterprises that have demanding work loads to create electronic work order and trouble ticket routes that can be dispatched between work groups until work completion. The workflow management system is integrated dynamically into the CAIRS database allowing work groups to access and update database tables from a single work order.

- **Subscriber Management**

The CAIRS Subscriber/Directory Management system provides a flexible relational architecture to manage easily the subscriber/directory database. The system automatically updates subscriber data as additions, moves, deletions, and changes occur through the provisioning or work flow modules. The system offers a global reporting interface for generating reports (impromptu and standard) and making global changes (view, move, swap, replace, change, and duplicate) to the subscriber database. The subscriber record provides a comprehensive view of the complete make up of the service listing: directory, billing, equipment, connectivity, and switch data. Other enterprise applications can easily share directory data.

- **Inventory Management**

The inventory management module provides an easy-to-use, on-shelf, and installed inventory-tracking system. As work orders and trouble tickets are completed, inventory levels automatically decrease or increase depending on the order type. The system automatically notifies administrators when the on-shelf inventory item drops below the safety stock

level. Through the inventory system, create stock orders to order new equipment from vendors. Detailed vendor mailing and billing addresses exist for each vendor. Each inventory item can contain a one-time and recurring cost. Automatically calculated billing total and taxes apply to processed word orders.

Reports for on-shelf inventory include:

- Items below safety stock levels
- Items nearing safety stock levels
- On-shelf quantity
- Items to be reordered
- Item details
- Available Ports/LEN
- Available Line License

Inventory reporting tools to analyze equipment and billable items are in service. You can generate reports by specific inventory items, category type (equipment, services, labor), location, customer. In addition, generated reports are available to analyze equipment dependencies, such as features that depend on other features.

Ordering Information

For further information, contact the Nortel Select Product Program at (615) 432-4995 or select@nortel.com

SOLUTIONS, SERVICES AND PRODUCT INDEX

Access Stack Node Router	463
Adaptive Clients Solution	32
Advanced Remote Node Router	454
Agent Greeting	189
AMC Multichannel Integration Suite	529
Application and Web Switching	296
Application Gateway 1000	115
Application Switch 2208	296
Application Switch 2216	296
Application Switch 2424	296
Application Switch 2424-SSL	296
Application Switch 3408	296
Application Switch Portfolio	300
Applications Center	30
Audio and Video conferencing (Meet Me)	160
Backbone Concentrator Node	466
Backbone Link Node	466
Backbone Node Router	466
BCM200	66
BCM400	66
BCM50	59
BES 110-24T	77
BES 110-48T	77
BES 120-48T PWR	77
BES 120-24T PWR	77
Business Access Point 120	81
Business Continuity System 3000 Branch Office	525
Business Continuity System 3000 Data Center	521
Business Continuity System 3000 Portfolio	520
Business Element Manager	76
Business Ethernet Switch 100 Series	77
Business Made Simple	VII
Business Secure Router 200 Series	84
Business Secure Router 222	84
CallPilot	174
Campus Mobile Worker Solution	20
Carrier Ethernet	507
Chargers	157
Common Photonic Layer	490
Communication Server 1000 Element Manager	93
Communication Server 1000 Portfolio	90
Communication Server 1000 Series System Management	93
Communication Server 1000 software release 4.5	92
Communication Server 1000 Telephony Manager 3.0	117
Communication Server 1000E	92
Communication Server 1000M	93
Communication Server 1000S	92
Communication Server 2100	120

Communication Server 2100 Compact Platform	124
Communication Server 2100 Processors	124
Communication Server 2100 Software Release SE09	123
Communication Server 2100 XA Core Platform	124
Communications Control Toolkit - Communications Telephony Integration Portfolio	219
Communications Control Toolkit - Contact Center Portfolio	186
Communications Control Toolkit - Self-service Portfolio	217
Computer Telephony Integration Portfolio	218
Concord Communications eHealth Suite	531
Configuration Cradle	157
Contact Center - Manager	185
Contact Center - Multimedia	185
Contact Center - Outbound	186
Contact Center 6.0 and Microsoft Converged Office Solution	30
Contact Center 6.0 Suite	183
Contact Center Portfolio	182
Contact Recording and Quality Monitoring	192
Converged Branch Office Solution	31
Converged Office	171
Converged Voice and Data Solution	37
ConverTec Console.NET	533
Corporate Directory Dialer	215
Custom-built Security Operations Centers	55
Data Networking Solution	40
Datapulse IP Operator Gateway	536
Digital Desktop Portfolio	245
Dual Mode Mobile Client 3100 (DMM 3100) and the Dual Mode Client 3100 with VPN Software	146
E-mail Manager	185
Enhanced USB Headset Adapter and the Mobile USB Headset Adapter	155
Enterprise and End-user Communities	XI
Enterprise IP Telephony Portfolio	88
Enterprise Network Management System (ENMS)	423
Enterprise Policy Manager (EPM)	427
Enterprise Subscriber Manager	433
Ethernet Routing Switch 1424T	373
Ethernet Routing Switch 1600 Series (1648T/1624G/1612G)	369
Ethernet Routing Switch 3510-24T	379
Ethernet Routing Switch 5510	383
Ethernet Routing Switch 5520 Series	388
Ethernet Routing Switch 5530-24TFD	393
Ethernet Routing Switch 8300 Series	362
Ethernet Routing Switch 8306 Series	367
Ethernet Routing Switch 8310 Series	367
Ethernet Routing Switch 8468GTR module	348
Ethernet Routing Switch 8600 Chassis (8003)	348
Ethernet Routing Switch 8600 Series	347
Ethernet Routing Switch 8600 Web Switching Module	356
Ethernet Routing Switch 8660 Service Delivery Module	353

Ethernet Routing Switch 8661	359
Ethernet Routing Switch Chassis 8600 (8006)	348
Ethernet Routing Switch Chassis 8600 (8010)	348
Ethernet Routing Switch Chassis 8600 (8010CO)	348
Ethernet Routing Switch Fabric 8692 SF module	348
Ethernet Routing Switch module 8630 GBR30	349
Ethernet Routing Switch module 8683 XZR3	349
Ethernet Routing Switch Portfolio	346
Ethernet Routing Switch Redundant Power Supply 15	376
Ethernet Routing Switch Web Switching Module	297
Ethernet Switch 325	398
Ethernet Switch 425	401
Ethernet Switch 460-24T-PWR	405
Ethernet Switch 470	410
Ethernet Switch 470-PWR	414
Ethernet Switch Portfolio	397
Ethernet Switch Power Supply Unit 10	419
Expert Anywhere Solution	23
Find a Reseller or Channel Partner	XII
Global Industry Recognition	IX
Global Services	44
Headsets	157
Holsters	157
Home Page	XI
Hospitality Messaging Server 400	180
Instant Messaging (IM), presence, and collaboration	160
Integrated Applications Portfolio	253
Integrated Call Assistant	264
Integrated Call Director	258
Integrated Conference Bridge	254
Integrated Recorded Announcer	261
Integrated Voice Services	266
Introduction	VII
Intrusion Sensors and Threat Intelligence	341
IP Address Domain Manager	436
IP Analog Gateway from Mediatrix	541
IP Audio Conference Phone 2033	131
IP Client Accessories	155
IP Client Manager	125
IP Clients	128
IP Desksets	130
IP Line Card	235
IP Media Gateway 9000	125
IP Phone 1100 Series	139
IP Phone 1120E	141
IP Phone 1140E	141
IP Phone 2000 Series	130
IP Phone 2001	131

IP Phone 2002	131
IP Phone 2004	131
IP Phone 2007	131
IP Phone Key Expansion Module	135
IP Services Routing Portfolio	471
IP Softphone 2050	148
IP Trunk Card	237
ipDialog SipTone III SIP Phone	538
Large IP Telephony Platform	119
Large Line Gateway Portfolio	125
Large Meridian Platform	240
Large Trunk Gateway Portfolio	124
M3900 Digital Telephone Series	246
M3901	248
M3902	248
M3903	248
M3904	249
M3905	249
Maintenance Services	48
Managed Maintenance Services	50
Managed Network Services	50
Managed Onsite with Spares Services	48
Managed Security Services	50
Managed Services	50
Managed Spares Services	48
Managed VPN Services	50
Media Gateway 1000 Portfolio	94
Media Gateway 1000E	94
Media Gateway 1000M	94
Media Gateway 1000S	94
Media Gateway 15000	124
Media Gateway 3000 series	125
Media Gateway 7480	124
Media Gateway Portfolio	100
Media Processing Server 1000	204
Media Processing Server 500	199
Mediatrix	541
Meridian 1 PBX 11C Cabinet (wall-mounted cabinet)	230
Meridian 1 PBX 11C Chassis (rack-mounted chassis)	230
Meridian 1 PBX 61C	230
Meridian 1 PBX 81C	230
Meridian 1 PBX Portfolio	227
Meridian 1/Communication Server 1000 Integrated DECT	267
Meridian M2250 Digital Attendant Console	251
Meridian M2250 Digital Attendant Console and PC Console Interface Unit	251
Meridian SL-100	241
Mertek JCS Cable Assembly	544
Messaging 100	176

Messaging 150	176
Metro Ethernet Routing Switch 8600	508
Metro Ethernet Services Unit 1800/1850	516
MG 3200	125
MG 3500	125
Mobile Voice Client 2050 (MVC 2050)	149
Mobility Solution	39
Mobility Solutions	14
Multimedia Applications Solutions	29
Multimedia Clients - IP Clients	151
Multimedia Clients - Unified Communications	167
Multimedia Communication Server 5100	159
Multimedia Communications Solutions	26
Multimedia Manager	185
Multimedia Infrastructure Solutions	31
Multimedia Office Client	168
Multimedia PC Client	168
Multimedia Security Portfolio	164
Multimedia Web Client	168
Multimedia Wireless Client for BlackBerry	169
Multiprotocol Router 2430	451
Multiprotocol Router 5430	460
Multiprotocol Router Portfolio	450
Multiservice Access Switch 4400 Series	457
Multiservice Switch 15000	447
Multiservice Switch 7400 Series	443
Multiservice Switches	441
Multiservice Switches Portfolio	440
Network Assessment and Audit Services	52
Network Management	422
Norstar 7.0 Software and Digital Mobility	224
Norstar Call Center	225
Norstar Integrated Communication System	222
Norstar Personal Call Manager	225
Norstar Portfolio	221
Norstar TAPI Manager	225
Norstar VoIP Gateway	225
Norstar: CTI Adapter	225
Norstar: CTI - Personal Productivity Suite	225
Norstar: Systems - Compact 3x8	223
Norstar: Systems - Compact ICS	224
Norstar: Systems - Modular ICS	224
Optical Metro 1000 Series	511
Optical Metro 1200	514
Optical Metro 1400	514
Optical Metro 1450	514
Optical Metro 3000 Series	481
Optical Metro 3400	482

Optical Metro 3500	483
Optical Metro 5000 Series	485
Optical Metro 5100	487
Optical Metro 5200	487
Optical Metro 5200 Cabinet	487
Optical Metro Platforms	480
Optical Multiservice Edge 1000 Series	494
Optical Multiservice Edge 1010	494
Optical Multiservice Edge 1030	494
Optical Multiservice Edge 1060	494
Optical Multiservice Edge 6110	499
Optical Multiservice Edge 6500	503
Optical Multiservice Edge Platforms	493
Optimization Services	52
Partner Information Center	XI
PC Console Interface Unit (PC CIU)	251
Proactive Voice Quality Management (PVQM)	430
Qovia E911 Location Gateway Server	545
Quintum Tenor Multipath VoIP Gateway	547
Real Time Monitors Reporting	550
Real-time Threat Intelligence License	340
Remote Agent Observe	187
Remote Gateway 9100 Series	108
Remote Gateway 9115	109
Remote Gateway 9150	111
Repair Services	48
Resilient Packet Ring	483
SE09 Features for Meridian SL-100 and Communication Server 2100	242
Secure Information Access Solution	11
Secure Information Access	12
Secure Multimedia Controller 2450	164
Secure Multimedia Solution	4
Secure Network Access Portfolio	304
Secure Network Access Solution	6
Secure Network Access Switch 4050	305
Secure Router 1000 series	326
Secure Router 3120	326
Secure Router Platforms	325
Secure Router Portfolio	324
Secure Wireless Access Solution	9
Security Compliance Services	54
Security Consulting Services	55
Security Portfolio	294
Security Services	54
Security Solution	41
Security Solutions	1
Select Products	528
Self-service Portfolio	198

Services Edge Router 5500	472
Small and Medium Business (SMB) Data Portfolio	75
Small IP Telephony Platforms	59
Small- to Medium-Sized Business Solutions	34
SMB Portfolio	58
SMB Solutions	36
SoftClients	144
Soft-ex Call Management Solutions	553
Software Services	48
Speech Server	210
Support Services Solution	42
Survivable Remote Gateway 200/400/50	104
Survivable Remote Gateway Portfolio	103
Switched Firewall 5100 series	329
Switched Firewall 5106	329
Switched Firewall 5111	329
Switched Firewall 5114/5124	329
Switched Firewall 6000 Series	336
Switched Firewall 6416/6426	336
Switched Firewall 6616/6626	336
Switched Firewall Portfolio	329
Switched Firewalls	330
Symon Enterprise Server	557
Symposium Express Call Center	194
Technical Support Portal	XI
Technical Support Services	48
Teleopti Contact Centre Solutions	560
Telephony Solution	38
Teleworker and Road Warrior Solution	18
Third-party Analog Gateways	125
Threat Protection System Portfolio	340
TPS 2050-IS	344
TPS 2050-TI	344
TPS 2070-DC	344
TPS 2070-IS	344
TPS 2070-TI	344
TPS 2150-IS	344
TPS 2170-IS	344
Traffic Study and Optimization Services	52
Training and Certification	XII
Unified Communications Platforms	158
Unified Messaging 2000	179
Unified Messaging Portfolio	174
Unique Communications CAIRS OSS	564
User personalization	160
VLAN tagging	336
Voice over Wireless LAN Handsets	152
Voice over Wireless Local Area Network Telephony Manager	284

VoIP Access Devices and Gateways	541
VPN Gateway 3050 and 3070	309
VPN Portfolio	308
VPN Router 1010	322
VPN Router 1050	322
VPN Router 1100	322
VPN Router 1750	323
VPN Router 221	321
VPN Router 251	321
VPN Router 2700	323
VPN Router 5000	323
VPN Router 600	321
VPN Router Portfolio	316
Web collaboration	160
Web Communication Manager	186
Web-Centric Self-Service	212
Wireless Access Point 7220	289
Wireless Bridge 7230	289
Wireless Gateway 7250	289
Wireless LANs	272
Wireless Local Area Network 2300 series	273
Wireless Local Area Network Mobile Adapter 2202	281
Wireless Mesh Network Portfolio	289
WLAN Access Point 2330/A	274
WLAN Application Gateway 2246	287
WLAN Handset 2000 Series Accessories	157
WLAN Handset 2210	152
WLAN Handset 2211	153
WLAN Handset 2212	153
WLAN Management Software System	274
WLAN Security Switch 2300 series	273
WLAN Security Switch 2350	273
WLAN Security Switch 2360 and 2361	273
WLAN Security Switch 2380	274
WLAN Telephony Manager 2245	284

NORTEL REFERENCE GUIDE - Tabs

Mark your most referenced sections with these tabs.

SMB Portfolio				
		Enterprise IP Telephony	Large IP Telephony	IP Clients
SMB Portfolio		Enterprise IP Telephony	Large IP Telephony	IP Clients

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Secure Network Access	Secure Network Access		VPN Portfolio	Secure Router Portfolio	Switched Firewalls
Secure Network Access	VPN Portfolio		Secure Router Portfolio	Switched Firewalls	
Threat Protection System	Threat Protection System		Ethernet Switches	Network Management	
	Ethernet Routing Switches				
Threat Protection System	Ethernet Routing Switches		Ethernet Switches	Network Management	
Multiservice Switches	Multiservice Switches		IP Services Routing Portfolio	Optical Metro Platforms	
	Multiprotocol Routers				
Multiservice Switches	Multiprotocol Routers		IP Services Routing Portfolio	Optical Metro Platforms	
Optical Multiservice Edge Platforms	Carrier Ethernet		BCS 3000 Portfolio	Select Products	
Optical Multiservice Edge Platforms	Carrier Ethernet		BCS 3000 Portfolio	Select Products	

